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QL WORLD

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14 18 MICRO DRIVES & OTHER INFO
19 20 28 32 40

QL INDEXER
Just following orders

SOFTWARE FILE
Sam the Little Spaceman
Brain Teaser
MusiQL

REVIEW: LOW COST IMAGE SCANNER FOR THE QL

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SINCLAIR QL WORLD

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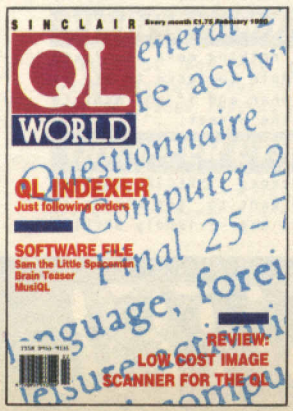


NEXT MONTH

TOOLKIT TUTORIAL

More help with handling Tony Tebby's Toolkit 2.

FANCY STUFF PART 2

Clever print, now in the pipeline.

QL SCENE

Microcassettes are finished

Ablex, the sole manufacturer of QL microcassettes, has announced that it is no longer able to produce or supply the cartridges. The characteristic black cassettes, known colloquially as Microdrives or mdvs after the QL drive system and device commands, were exceptional to the QL design and have attracted fierce opposition and defence during their lifespan.

Although some suppliers estimate that 75 percent of QL users now have disc drives, the drying-up of the Microdrive supply will be a blow to many users.

Although there are modest quantities of mdvs still in circulation, there is every sign that they will soon become difficult to obtain. QL software suppliers were caught unawares after being told by Ablex earlier in 1989 that it would continue to manufacturer and stockpile mdvs into 1990.

"If we had known this would happen I would not have been happy to sell 20 mdvs at a time to customers," says David Batty of Sector Software. The *QL World* Microdrive Exchange is among the smaller software publishers which will be forced to reorganise its production completely if mdvs become unavailable.

QL suppliers attempting to re-stock have been told that Ablex can no longer obtain the necessary components to make mdvs. Ablex production manager David MacSorley blames the problem squarely on the non-availability of suitable magnetic tape, a shortage which gave rise to anxiety about mdvs earlier last year. At one point it looked as if the problem was resolved, with stocks of new tape apparently arriving from BASF in Germany. Now MacSorley says that BASF has "changed" its mind" about the tape and there is no alternative supplier.

"We wanted to continue manufacturing well into 1990 but now we are not being allowed to do so because there is no tape," he told *QL World*. The QL apparently uses a special tape but MacSorley is not sure in what way the tape differs from commonly-available audio and video tape. "You would have to ask the original designers that," he said.

Ablex has no further stocks of mdvs, "No-one has been buying in volume in the last few months," he said when asked if he could tell *QL World* who had been buying stocks.

Bulletins

The November, 1989 Quanta Bulletin, Volume 6 issue 10, is now out. The contents include notes on getting the correct QL plugs for fold-over connectors, RAM testing, setting up on Prestel and Micronet, a review of a new library program, KEYWORDS, which would be especially interesting to a new user not able to obtain a manual, a history and update on the activities of QView – creator of the Minerva ROM – a piece on packet radio, Upgrading for Beginners, and club business.

The December, 1989 issue of the Quanta bulletin contains features on local meetings, printer drivers, the Rebel hard disc interface, tips on Supercharge, some games reviews, the usual club business, and an appeal draw on behalf of Children In Need, with a list of software prizes.

Send enquiries to and about **Quanta to Phil Borman, 15 Grosvenor Crescent, Grimsby, S. Humberside DN32 0QJ** with SAE for reply.

Quanta in Bristol

Following the success of the last Quanta Workshop at Portishead, Bristol, which was attended by at least 200 QL users, it has been decided to hold another one on March 4, 1990.

Several traders have already expressed an interest in attending, including Thor International Computer Systems APS of Denmark, which is expected to attend so long as it is economically viable. Digital Precision has informed the organiser that it expects to announce a new product on the occasion, together with special discounts for the event.

The group is organising the hire of a large-screen video to assist traders to demonstrate their products more easily, on a seminar basis. The intention is to allocate half an hour to each trader who wishes to use the equipment. "The days are gone," it says, "when potential punters have to peer into a 14in. monitor to see a product demonstrated."

Several German product manufacturers have been contacted about the event and it is hoped that some will be able to attend.

Transport will be provided at regular intervals between Temple Meads station and the venue. Refreshments will be available on the day, with a bar between noon and 2pm.

For further information telephone **Chris Gregory** of the **Bristol Local QL Users' Group on 0272 513653 after 6pm.** It is advisable to check if you wish to see a particular trader that that business will be attending.

Adventurers' Forum

QL Adventurers' Forum no.8 is out and contains solution hints to *Imagine* and *Fantasia*, reviews of *The Fugitive* and *Grey Wolf*, hints on wargames, a games helpline, hints on *MacSporran's Lament* and *Aquanaut 471*, notes on *Colossal Cave* and *Mortville Manor*, the Fifth Column report on 'other computers', a *Colossal Cave* map, reviews of *3D Wanderer*, *Uncle Loonie's Legacy*, *3D Slime* and *Star Trek*, and hints on *Nemesis*, as well as news and general hints columns and two pages from D.C. Blunder's Notebook.

QLAF costs £1.25 or you can subscribe. Contact **C.G.H. Services, Cwn Gwen Hall, Pencader, Dyfed, Cymru SA39 9HA.**

OPEN CHANNEL

Open Channel is where you have the opportunity to voice your opinions in *Sinclair QL World*. Whether you want to ask for help with a technical problem, provide somebody with the answer, or just sound off about something which bothers you, write to: Open Channel, Sinclair QL World, Greencoat House, Francis Street, London SW1 1DG.

Codes

The 'list' of corresponding codes for QL and printer required by Norman Durrant — *QL World*, October, 1989 – depends on the printer. Epson printers use the ASCII code for storage of characters, whereas the QL uses it only in the range 32 to 127, excluding 96. For other characters, it is necessary to use the translate:

QL, ESC, ETX, PRT

where QL is the numerical doe used by the QL for the character to be translated and PRT is the code used by the printer for the same character. The example for the £ signal given in a letter appears more complicated because codes for switching to and from the English character set are included. The Quill software permits a maximum of only 10 translates but QL SUB has published a program, *Backseat Drive*, which allows for up to 256.

David Scott,
Lee Green,
London SE12.

Help

Recently I obtained a Delta disc interface by Technology Research Inc. and no-one here can tell me how to utilise the optional 128K of memory. It operates disc drives satisfactorily but I need the extra memory it supposely provides. It had four empty IC sockets for the memory chips and I installed some 4464 chips but obtained no additional usable memory. The instruction book gives no clue what to do, so I hope someone in the U.K. can tell me how to access the additional memory.

Claude Schleyer,
9501 Camino del Sol, N.E.,
Albuquerque,
New Mexico,
USA 87111.

Citizen

For Citizen 120D dot matrix printer owners, here is an alternative set of printer control codes to those given by C. Dodson — *QL World*, January, 1989, which does not use any standard keys; is easy to use and easy to remember. Set the translates as follows:

Underline on ESC, 95, 49
Underline off ESC, 95, 48

Bold on ESC, 69
Bold off ESC, 70

High on ESC, 83, 48
High off ESC, 84

Low on ESC, 83, 49
Low off ESC, 84

NLQ on CTRL 1 145, ESC, 120, 49
NLQ off CTRL 2 146, ESC, 120, 50

Italics on CTRL 3, 147 ESC, 52
Italics off CTRL 4, 148 ESC, 53

Reverse on CTRL 5 149, ESC, 114
Reverse off CTRL 6 150, ESC, 116

Vertical enlarge on CTRL 7 151, ESC, 104

Vertical enlarge off CTRL 8 152, ESC, 117

Expanded print on CTRL 9 153, ESC 87, 49

Expanded print off CTRL 0 144, ESC, 87, 50

None of these control codes will appear in the printed document if the printer is set to EPSON FX#2 and reverse will not work in NLQ, which must first be switched off.

Phillip Crosby,
Gateacre,
Liverpool.

Ink

Dennis Briggs' article on re-inking printer ribbons prompts me to share my method with other readers. While more labour-intensive, it is universal, providing one can somehow access the entire length of ribbon. I find W.H.Smith stamp pad ink particularly suitable, as the nozzle diameter is just right. The other requirement is a cotton bud.

Cut the stem of the cotton bud in half at an angle of at least 45 degrees. You then have two tubes, one end pointed, the other surrounded by the bud. Press the pointed end into the ink bottle nozzle so that the complete diameter enters by two or three millimetres. Invert the bottle and squeeze gently. It may be a very crude felt-tip pen bit it is ideal for our purposes.

Squeezing gently, apply a line all the way along the centre of the ribbon. Do not be tempted to over-ink, as your printer head will not appreciate it. Practice makes perfect, Now the difficult part; allow 24 hours for the ink to permeate thoroughly. Stamp pad ink does not seem to dry as does ordinary ink and you will notice the printhead uses only less than one-third of the ribbon width at the centre. The remainder acts as a reservoir of ink which migrates to the centre as it becomes depleted. All

Editor's notebook

The most significant news *QL World* has received lately has been the demise of a reliable supply of microcassettes. After a period of will-they, won't-they, followed by an apparent yes-they-will, our hopes were firmly scuttled at the end – if we assume that this is the end – by a final no, they will not. There is no more tape.

With no supply of new microcassettes, smaller dealers will be hit hard in their efforts to supply budget software. Microdrive Exchange has already been compelled to cease supplying cassettes to customers, so that readers now ordering *QL World* software will have to supply their own.

The day of the cassette conservationist has arrived.

It is also the day of the disc user; 3.5in. floppy discs, for example, are more expensive then microcassettes but provide far more memory, are more reliable and travel better; 5in. discs are cheaper but not so resilient. There are also hard discs. Let us see what the future offers.

***QL World* would like to hear from readers Jay Lowington, Paul McKinnon, Alan Pemberton, Geoff Evelyn, R. Clements, R. Davidson, Steve Deary, Richard Cross, Richard Williams and Axel Berle. Where are you?**

this technology and your printer relies on a very long wick.

This method has served me well. I measured 20 metres of ribbon in my Epson cassette, so you can imagine the delight of a friend with an Amstrad printer which has 2ft. ribbons at about the same price.

Changing ink colour is no problem if it is to be black. Otherwise, your best course is to remove the ribbon and wash it, as new ink will mix with any remaining black ink. I found paint brush restorer worked best, although at the time the ribbon was still wet from an abortive attempt to wash it in petrol. Worse still, it was leaded. After drying a light grey colour it is ready to re-use and when reloading be sure to get the smoothest side of the join facing the paper.

Roj Slawson,
East Molesey,
Surrey.

Editor's comment: Remember that stamp pad and printer inks are often intended to be permanent and can be extremely difficult to remove, so proceed with care or the price of a cheap ribbon could be an expensive reclothing or re-carpeting job. On the same theme, do not confuse paintbrush restorer with paint stripper, which is sometimes recommended to restore hardened brushes and is extremely caustic to any fabric – or plastic-based material – and to skin.

NFS_VSE

The article in the July edition by John Davis, Networking the QL, was excellent. He also solved what had been a problem for me, of addressing several devices over the network by his ingenious use of 'dev' in the NFS_USE command. I use two machines in network, my original AH model expanded with Toolkit " " on ROM and an Expanderam as the slave machine and a newer JS machine with a Trump Card, which is the main machine and acts as the network server linked to a QL hard disc and twin 3.5in. floppy drives, as well as a printer.

The main problem is the string length which can be accepted by the NFS_USE command and the file server as a translation of, for example, "devl_". The limit appears to be 15 characters including the underscores which, when addressing a directory system on the hard disc, is very limiting on directory names and levels. I had to limit my directory names to two characters. The translation of "devl_" might be, for example, "nl_winl_PR_LT_" giving a total of 14 characters. This brings me to my next point.

Simon Goodwin regularly requests suggestions for DIY Toolkit. Since the number of QL users with hard discs is likely to increase it would seem to be very useful if patches for the Toolkit II command NFS_USE and, if necessary, the file server could be written which would allow much longer strings to be used so that the number of levels in the directory tree could be increased and the names could be longer to be more clearly descriptive of the contents.

Incidentally, I regularly use at work a Hewlett-Packard RS16 machine – an 80386/80387-based IBM-compatible with a nominal CPU frequency of 16MHz which is on a network system. While all the 'goodies' of such a set-up are available, I find that for most work the QL is just as easy to use and to switch between programs or to use expert/import routines is far easier on a multi-tasking QL. The advantage of the H-P shows mainly when interrogating large databases and with programs running complex mathematical procedures, which clearly take much longer on the QL.

I have subscribed to *QL World* and *QL User* since they were first published and I always find more than one article of interest. Reviews of serious programs, the series on the Psion programs, DIY Toolkit, and other technical articles are the items which interest me most, since my use of the computer is almost exclusively serious. Please keep up the good work.

W.P.J. Bailey,
Purley,
Surrey.

Queries

Congratulations on maintaining a high standard of publication so long after the sad demise of the QL. The quality of support and the reasonably-priced software available for the QL continue to amaze me.

Two queries raised in recent issues may be of general interest. I had occasion to seek Psion help on the format of Archive files. I was told files are ASCII with each field in quotes, adjacent field separated by a comma, and each separated by a CR. Readers may find this useful in recovering files.

The incompatibility of certain modern drives with the disc interface controller may sometimes be overcome by setting internal links on the disc drive PCB. It may well require a request for technical assistance from the main agent. I have the full specification of the 96TPI Tandon TM101, 5.25in. drives: if anyone needs one, please contact me with a SAE.

I have looked in vain for a Medic disc interface, preferably 512K. If anyone is hoarding a spare which they would like to swap for my Tandata QConnect and QMod, please telephone me on 0449 767130. I also want back issues of *Quanta* magazine and Microvitec Cub 653.

Ron Allpress,
Karibu,
Wickham Road,
Thwaite,
Nr. Eye,
Suffolk, IP23 7EE.

Oki

I have experienced problems using Oki printers in conjunction with the QL and would suggest that, to cure the incorrect TOF problem, run the Install_bas program and set the lines per page to 70 and continuous forms. I have tried printing Quill documents with a LPP setting of 66 but the sheet-feeder cases loss of the TOF setting.

Digital Precision offers an excellent screen dump program called Ultraprint. The program is in two versions, one for Epson compatibles and one for Oki printers. When ordering a copy you must ask specifically for the Oki version, as DP otherwise will send the Epson version.

Unfortunately I have had no luck producing printed output from programs which require a graphic driver other than a screen dump – e.g., *Page Designer 2, Techniql*, and so on, – obtaining results which varied from nothing at all being printed — Technicql — to the first line being printed only inverted and reversed by PD2.

It seems that the QL software suppliers, with the exception of Digital Precision, support only Epson compatibles.

As a plea to such companies may I request that either they make software compatible with printers other than Epson or that their advertisements make it clear which printers are suitable for use with their products?' There is no greater disappointment than awaiting a new program anxiously only to find that you can use every function except the ability to produce printed output.

Alan Bancroft,
Wellingborough,
Northamptonshire.

Jones

Recently I bought a copy of Jan Jones' excellent work *QL SuperBasic – The Definitive Handbook*. Such user-friendly erudition is rare. I wonder if it would be possible to arrange to publish an interview with or an article by Jones? Her preface to the second edition of her book suggests that there are at least some changes she would, with hindsight, have made to her creation and I am sure that many readers as well as myself would be very interested in reading about them. Perhaps one of your regular contributors could publish code to implement them?

Apart from technicalities, I would be fascinated to read an article by or about the founder of SuperBasic.

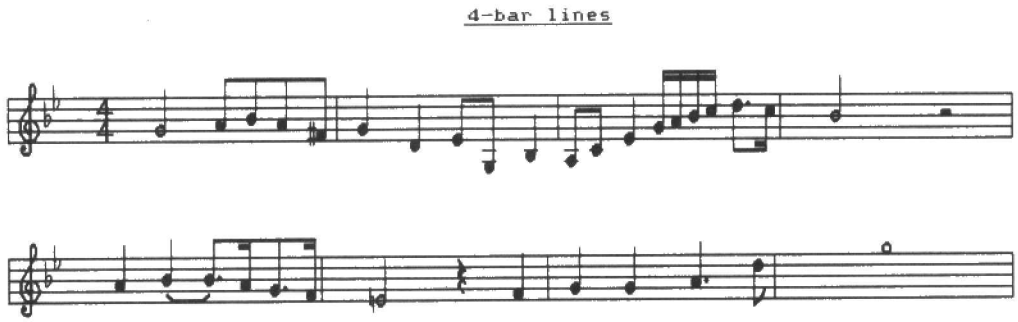
Brian Storey,
Tyne and Wear.

Editor's comment: For a time there was a rumour that Jan Jones, like many other people who have been intensely involved in launching something which has never attained the popular success it deserved – by which I mean the QL – had seen enough of SuperBasic and the QL to last her a lifetime. The reappearance of her much-requested book, however, gives us cause for hope. No promises, of course, but we will make enquiries.

INFORMATION:
Program: Musiql
Price: £25
Supplier: I.N. Back, 1 The Chase, London SW4 0NP.

MUSIQL

Eleanor Patrick tests a practical program for printing high-quality music notation, with a manuscript printing facility.



People are scornful about the musical capabilities of the playing QL so let me start by saying *Musiql* is not a music-playing program but a means of writing tunes into memory for the explicit purpose of printing them out to very professional standards. It does not suit the amateur who needs to have what he has written played back. You must be able to hear your composition in your head or copy it in after checking it on the piano.

My need as a teacher was to find something to use in conjunction with *Professional Publisher, Cueprint* and Quill which would enable me to produce for my recorder classes a better-looking music workbook. Handwritten music ruins the presentation.

Musiql program was advertised in the October issue of *QL World*. As promised, the sample printout, sent on request, was beyond belief. My long-suffering pen was impressed enough to send a cheque by return.

Three EXECutable and Supercharged tasks called TUNE, TUNEWRITER and MANUSCRIPT are incorporated into the program which is accompanied by a detailed and clear 16-page Quill_doc manual.

Additional memory – at least 256K – and a disc drive are required. The program was designed for a Canon PW1080A, which is what I have, but Back will send an appropriate printer driver if details are submitted on the order form.

After booting, the selection of CLONE from the initial menu produces a user copy. In answer to the question 'Okay to format f1p2_?' I pressed 'N' and the disc formatted. Luckily there was nothing irreplaceable on it. Five other options are then available – the three main programs, one called Accidentals for changing the default for sharps and flats and Quit.

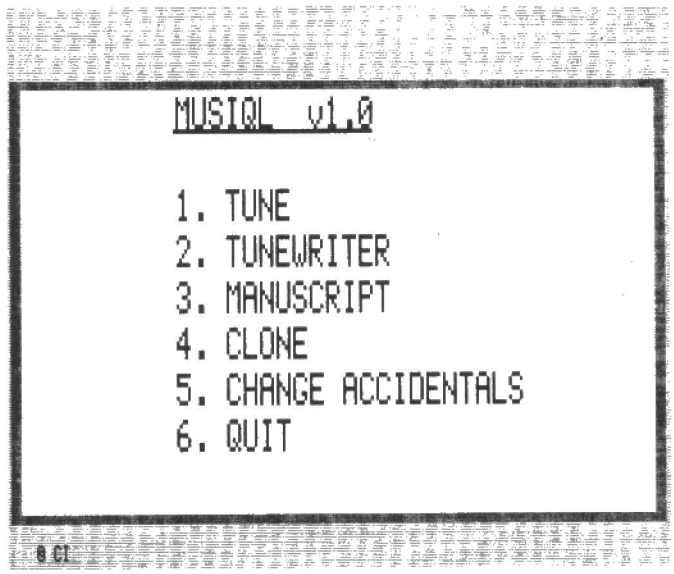
Options

The only option with anything much to show for itself on-screen is TUNE. Using a green-edged blackboard on a red ground, the options offered first are New, Old, View, Edit, Save, Rename, Extend, Clef change, Pitch change, Delete, Backup, Index, Mute bleep and Finish.

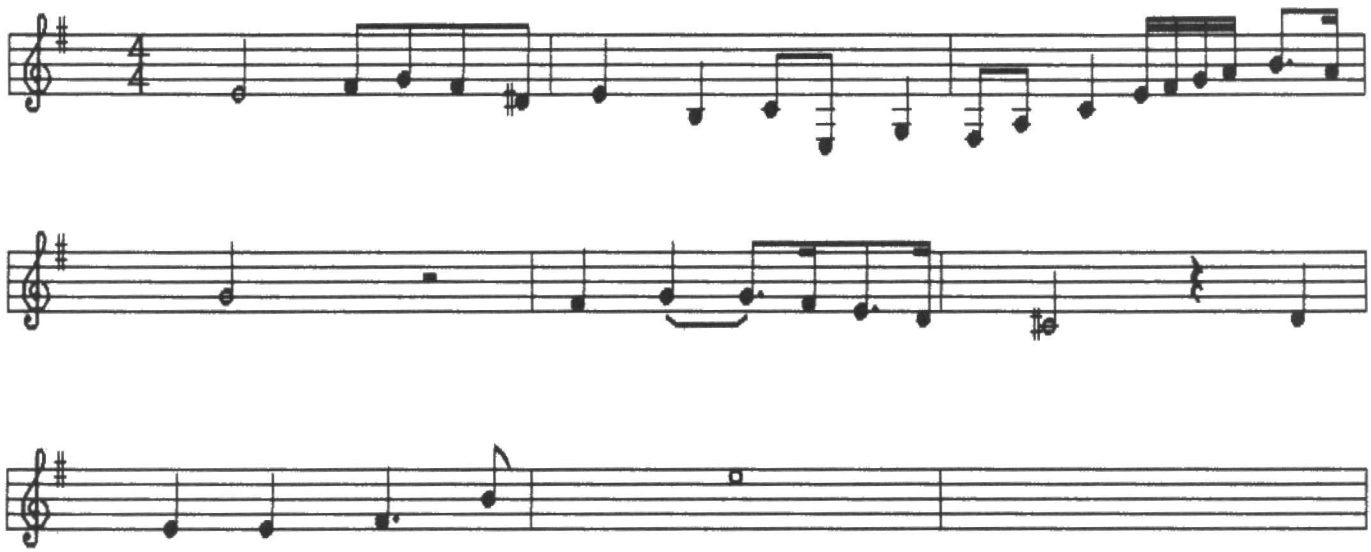
These are self-evident apart from Index, which prints-out a directory of your tunes from disc under a heading of your choice which is unrelated to their filenames.

If you are just starting, choose NEW which allows you to insert coded notes to write a melody. Prompts are visible while you write and it is very fast when you become accustomed to it. C5Q means a quaver on middle C, the 5 referring to the 5th octave on a piano. Your note is then drawn and labelled on the stave which is displayed one bar at a time in the middle of the screen. <CTRL> B ends that bar and another is drawn. <CTRL> E ends the tune. I was surprised not to see the whole tune at once but it does not matter, as you can scroll back and forth through it very quickly.

Most entries are by single keypress and there are full editing facilities, error trapping and messages. For instance, TUNE will not accept a bar which does not add up correctly to the time signature specified and a Save will not



3-bar lines



crash if the disc is full; they warn you.

You can use rests, empty bars, copy bars into empty bars and tie notes together. I found by trial and error that if you use the tie wrongly as a slur – i.e., to slur two different notes – the tie prints with a break in it as it tries to bend. A tie is not a slur.

You can write up to 256 bars in three common time signatures and save them under automatically-generated file names. The tune can then be transposed to, and viewed in, any other key without re-writing. The algorithms used for this are invaluable in getting it transposed to a musician's satisfaction.

The original is never lost while in memory. Later it can be retrieved from disc, using the QL command and an alphabetical directory, and still be edited or extended. In practical terms this means that when pupils of my class learn a new range of notes on the recorder I will load and print-out a tune they already know but in a new key which practices this range.

The tune displayed on the screen does not have notes joined, tied or spaced properly. This part of the design is printed automatically when using TUNEWRITER, which you select from the menu after (S)aving and (F)inishing with TUNE.

TUNEWRITER consists of messages and questions about what you want to print – utilitarian on-screen but brilliant in output.

Eight lines of printed music will fit on to one sheet. There is a choice of two, three or four bars per line, up to three blank bars first, and the option of draft or NLQ. Even draft is very readable compared to draft text output.

"Musiql will produce printouts to make them proud of their work."

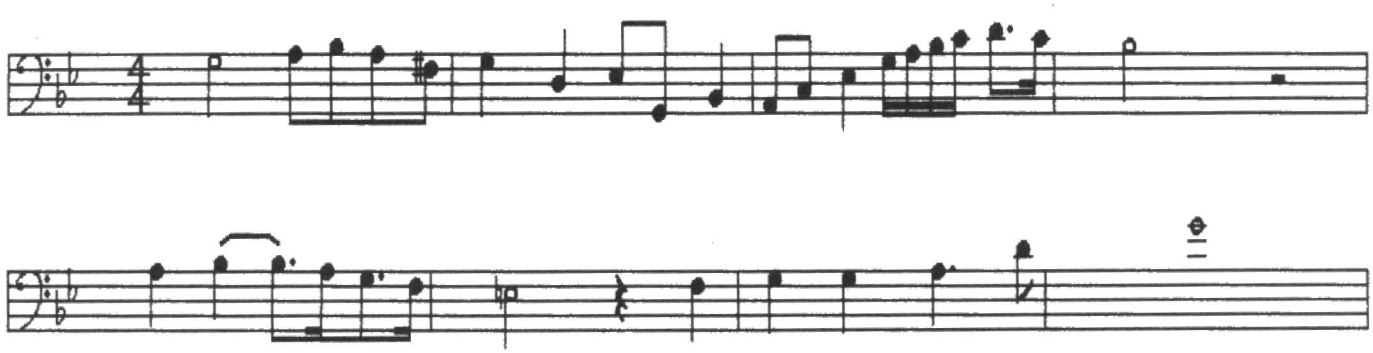
If you wish you can transpose at this stage but not alter the clef. Notes which fall outside the considerable range will be printed inside the range and marked 8ve, as is customary. Quavers and semiquavers are joined and triplets marked. The result is perfect, except for the lack of a double bar line at the end.

As my class experiments with melody writing I shall let them use Musiql to produce reasonable printouts which will make them feel proud of their work. For that reason I suppose I would have preferred the single minim or single semibreve in a bar to have been printed at the start of the bar and not in the middle but that is really nit-picking.

MANUSCRIPT is a little extra to save you buying manuscript paper. It prints 12 empty staves, with or without bar lines and key signature, and with any combination of treble and bass clefs bracketed.

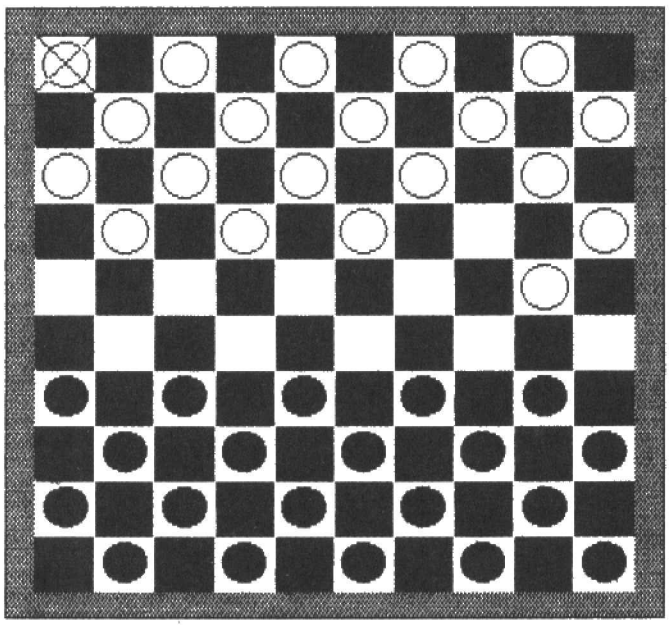
Musiql is a little specialist in nature but it was exactly what I had been seeking. Perhaps others are also. If version 2 were to appear one day it would be the icing on the cake to have provision in TUNE for writing bass and treble clefs together, when presumably it would be called Harmoniql.

Bass



SOFTWARE FILE

INFORMATION:
Program: QL SuperDAM: A Draughts Game for the QL
Price: 3.5in. or 5.25in. floppy disc: 999 B.Fr (£16.50 approx). 1 mdv: 1,199 B.Fr (£19.80 approx).
Supplier: Tron Software, Oude Vest 102, 9330 Dendermonde, Belgium.



QL SuperDAM

John Shaw cheques out a game of draughts for the QL.

SuperDam is a very versatile game of draughts – or checkers as the author, Joris van Damme calls it and, in programming it, he has spent a good deal of time trying to make it as user-friendly as possible. You can load and save games and get help on any level of play.

It also multi-tasks so, presumably, if you are becoming bored writing a letter to Aunt Matilda on the Quill section of your Taskmaster, then zap – or perhaps ALT 3 – and you could be moving and huffing against a very competent draughts player.

The program is reminiscent of the classic game Psion Chess, inasmuch as it can show a three- or two-dimensional representation of the playing board.

The menu system selected by the author is very easy to follow and caters for all levels of playing abiity and needs. It is possible for the computer to play itself at any of the three available levels – a very useful asset for the beginner. Also the human can play the computer, again choosing the level according to his ability. The levels can be changed at any time during the game.

It obeys all the rules of draughts including multiple catches and making kings and, in addition, if you need a hint, it will be displayed as well.

All moves are done by the cursor and ENTER keys in a very clear and pleasant display on the screen suitable for either monitor or TV set.

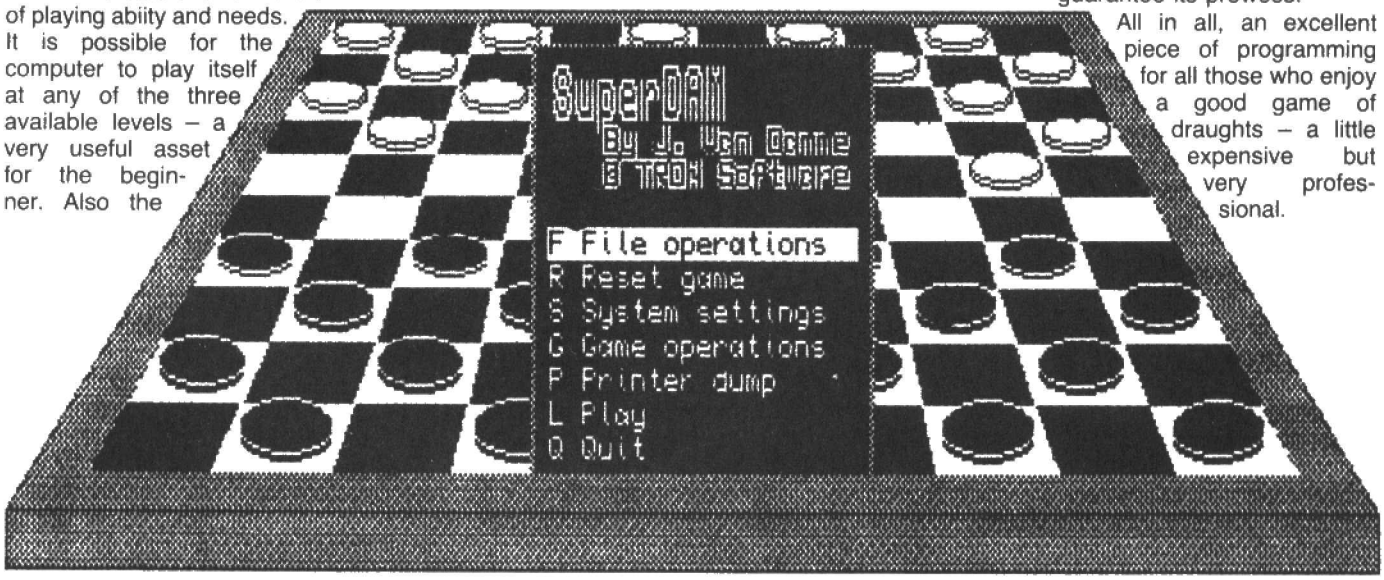
As a bonus, the author has provided a screen dump, or rather two. The first is a quick plan of the board using characters to represent the pieces; the second is a true screen dump with either one, two or three printer passes.

If that were not sufficient, there is also a 'file operations' section giving you the ability, while playing the game, to FORMAT, FILE DELETE, DIRECTORY, SAVE, LOAD or VIEW a game on any medium.

The manual provided with the game is very clear and comprehensive.

The main question, of course, is how good does it play? The answer I feel is very good. No-one in my home has been able to beat it at level three, although it succumbed to me a few times at level one. None of us, I hasten to add, is a grandmaster, so I cannot guarantee its prowess.

All in all, an excellent piece of programming for all those who enjoy a good game of draughts – a little expensive but very professional.



TROUBLE

A P R O B L

Bryan Davies examines Conqueror and a DIY toolkit routine.

Those who use the Psion programs and did not read Simon Goodwin's *DIY Toolkit* article in the October issue should look at it. No doubt some readers avoid such seriously technical articles because they do not understand them but there should be no problem understanding and typing-in the listing given in the box on page 34. It is a very short routine, contributed by an Austrian QL enthusiast Peter Postl, which achieves what many users must have wanted ever since the QL appeared – it makes all four programs of the Psion quartet multi-tasking.

Equally surprising is the speed with which it does it; about five minutes to type-in the routine and as many seconds to convert any of the four programs. You run the routine, it asks for the drive and program name, then returns almost immediately and advises that the program has been converted and can be run using the EXEC command.

The routine gives the Psion programs a cursor. The red block you have always seen and still see is just that – a red block, not a cursor in the SuperBasic sense. When you have a cursor you can use the CTRL+C command to step into and out of a program. The programs will still run from EXEX_W and the new cursor will still appear at top left of the screen but you will not be able to switch in and out then.

The simple operation worked satisfactorily on the 2.35 version of Quill, Abacus and Easel and on the 2.38 version of Archdev; it will work with the 2.0 and 2.3 versions also. It did not work on a Turbo+ version of Quill 2.35; the conversion appeared to work but the program – and the QL – locked up when EXECed.

As Turbo+ also gets into the Psion code and makes changes to it, it is not particularly surprising that there is some conflict. One point to remember, as stated in the article, is that changing the programs in that way does nothing to stop their memory-grabbing behaviour and you have either to run them in the correct order or reserve some memory before running them, to avoid one or two programs taking all the memory.

A quick check showed that the memory grabbed was least for Easel; next best was Abacus, then Archdev, Quill being the monster and taking almost every bit of memory. All four programs would co-exist individually with *Q_Switch*, two copies of *text87*, *FlashBack*, and *Ice*. It is remarkable that it has taken about six years for this routine to appear and that it is not from a well-known software source.

Continuous stationery is one of the items I have had difficulty obtaining in the past. The company from which I obtained the last two boxes is CCP in Croydon – 01-686 0046 — and it seems a recommendable supplier. Two thousand sheets of 70gsm micro-perforated A4 cost £20.65 including VAT; delivery may cost extra – I collected mine.

For those who find the limit of two disc drives attached to the Trump Card restrictive I am assured that later versions of the card support four drives and early versions can be changed fairly easily to support four. That information is from Adman Services, which also offers help in various other interface matters.

Rather than perform the rather extensive modifications necessary to convert pairs of ICL *One-Per-Desk* Microdrive units to work with the QL, a ready-built interface for the purpose can be obtained from Adman Services.

In the same vein, for those who dislike the effort of making 64-way extension connections to fit the expansion port, Adman can supply either a fold-over board or a 64-way ribbon cable with connector, both ready to attach to the port. Other interfaces available are for connecting a non-QL keyboard to the QL ribbon sockets, for buffering monitors, various specific QL-to-monitor adapters, and an EPROM board to fit the ROM port and take your favourite ROM.

Appropriate

My complaints about the relatively poor-quality text and graphics printing from most QL programs when using a 9-pin dot matrix printer have produced various responses, the most appropriate being a letter printed from Quill using the printer driver routine *CuePrint* on a Canon printer. The print was sufficiently good for it to be difficult to see the dots forming the characters without using a magnifying glass.

If one could always get this quality of text print and a comparable quality for graphics, there would be no real reason to want to change to an ink-jet or laser printer.

CuePrint utilises its own character font, on an EPROM chip, rather than those supplied with the printer. Some printers such as the Canon allow the user to design fonts and also have a spare chip socket for installing custom-designed character sets which can be loaded from ROM into RAM at print time. Given sufficient time and patience this could be the way to get really well-formed characters. CuePrint may still be available – it is believed to be usable only on the Canon PW1056/1080A and Kaga-Taxan KP-810/910.

Comparisons

PC Conqueror has now been available for some time and it is possible to make some comparisons with the earlier MS-DOS emulator, *The Solution*. Sensibly, the user interface of the two has been made much the same; you do not have to approach them as different programs. Inevitably, for a software emulation of a monster like the PC/MS-DOS combination, speed of operation is not stunning but there has been a worthwhile improvement. Benchmark tests are noted for giving false impressions but they are useful if taken with several grains of salt and the figures obtained seem to be in favour of Conqueror.

The Norton Utility Systems Information function gives the Computing Index of Solution as 0.1, with timer interrupts enabled or disabled. The comparison is made with the IBM PC/XT, which has a nominal 1 for the speed rating; that is, Solution comes out at 10 percent of XT speed. The System Information function of *PC Tools* 5.1 makes comparison with the "original PC", which may mean the predecesor of the PC/XT; it shows Solution as being 15 percent of PC speed with interrupts enabled. The result with interrupts disabled appears to indicate that the tests cannot be performed properly, so can be disregarded; performance should be better with interrupts disabled, despite what PC Tools shows.

The Norton test shows PC Conqueror as being 0.1 times XT speed but PC Tools gives a much different picture; with Conqueror the speed rating improves considerably when the default settings are altered. The default state is with interrupts enabled and the Graphics, Text and BIOS parameters are 10/6/32 respectively. In this state, PC Tools reports a speed of 55

percent of the PC, rising to 75 percent with settings of 4/4/96 and a remarkable 105 percent with 3/3/127. Again, the figures shown when interrupts are disabled appear to be unreliable as to speed.

The reservation you have to make is that large variations in benchmark results do not necessarily go hand in hand with similar variations in operating speed of the programs you run. It seems fairly likely that some program functions, and some types of program, will run faster under Conqueror if the defaults are changed.

Text entry with *WordPerfect 5.0*, a typical current PC WP program, was good with all Conqueror settings tested; there is always some lag between hitting the keys and seeing the characters on the screen but it is generally small enough to be no problem and is not a great irritant; it can be painful with Solution. The speed of cursor movement and with which commands are carried-out is more of a problem and it pays to try to stick to text entry.

Careful tailoring of the defaults can give performance better-fitted to the user's requirements. Try adjusting the PC programs defaults also – e.g., cursor speed setting in WP5.0 can be raised and RAM disc can be used for some files. When you have had enough fun playing with defaults, how about trying producing your own "environments" on disc? There is insufficient space to go into this matter but if you have used the CP/M emulator *Success* you will be familiar with the idea of encapsulating the whole operating system in a file and it can be done with Conqueror, too, but by the user.

Cartridges

Gordon Burdfield could not get his copy of *Professional Astrologer* to run, the Microdrives giving "bad or changed medium" messages. Digital Precision reported that none of its QLs could read the re-formatted cartridges returned to it and it was necessary to borrow a QL from another user to read from, and write to, the cartridges. A most unusual situation, now apparently remedied by Burdfield servicing the Microdrives on his QL and DP supplying a copy of the program made on the "other" machine.

As he says, "all's well that ends well" but it might be worthwhile for all suppliers to find some means of warning customers about the prime reason for commercial program cartridges appearing to be bad; that is, check your Microdrives first.

Humphrey Zimberlin reports receiving the anti-bounce chip he had been awaiting from **Schön.** Keyboard behaviour is now acceptable. Key bounce is an expression one has become accustomed to reading in connection with this keyboard but I have also seen it used in reference to the basic QL keyboard. Not having used the Schön keyboard I can only guess that what is being referred to is the appearance of several of the same character when the key has been hit once.

The phenomenon is familiar enough on the QL keyboard but, so far as I know, it is then always due to a faulty keyboard membrane. The membrane is the weakest component in the QL; I have had to replace it several times.

Character

Before deciding there is a fault in the QL, try altering the key delay and rate settings, in case it is a question of you being a little slow removing fingers from some keys. To adjust the delay between repeats of a character when the key is held down, type-in POKE_W 163980,n. The larger the value of "n" the longer the delay before a character is repeated; the default value is n = 30.

Make n too small and you will find it impossible to avoid repeats. To adjust the rate at which characters are repeated when a key is held down, type-in POKE_W 163982,n. The default is n = 2; the larger the value of n the more slowly characters are repeated. Do not expect any changes to be maintained if subsequently you load Quill because that program re-sets to its own defaults.

William Bradley asked for assistance obtaining goods ordered and paid for in March, 1989 from **SUB.** The reasons for mentioning the request now are that. Bradley is 85 years old and says that despite support from the local Citizens' Advice Bureau, a refund did not materialise until he took the matter to County Court. SUB commented that a refund cheque had been sent; part of the order was despatched some time ago but there was difficulty in supplying the remainder.

Bradley reports that the cheque has been received and cleared but his solicitor is now pursuing the collection of costs involved in obtaining the refund. Surely it must be possible to settle such matters before they get to this stage? There is a repeated complaint that the promised regular issues of newsletters have not materialised, subscribers having to be content with a very few issues so far. SUB accepts that newsletters have been slow in arriving but points to a good turn-round in dealing with written queries and an extensive bulletin board of QL-related tips. It has just sent me copies of issues 1, 2 and 3 and there is certainly a large amount of varied reading material in them – around 40 pages of small print; if sent monthly, as implied by the front page statement "THE MONTHLY PUBLICATION", they would justify the subscription.

An aspect which may not trouble readers as much is that two other QL suppliers state that people have reported to them having difficulty obtaining their programs and having been told by SUB that the reason was late delivery by the suppliers. The suppliers state the reason is that they refuse to supply anything to SUB unless money is paid in advance, because of previous difficulties obtaining money for goods supplied. It is understood that there are other suppliers who have had the same problem.

In fairness to SUB, most of the adverse comments received are second-hand and from other suppliers; SUB makes that point and states that the complaints it receives are also often second-hand and not supported by details of the person complaining. As of the end of November, 1989, it advises that a new issue of its magazine is due very shortly and will be accompanied by a new, temporary telephone number.

Surprising

Let us hope that SUB does not let its affairs go the way of those of **Eidersoft.** Enthusiasm for the QL and a willingness to give help are not sufficient when significant amounts of customers' money is involved.

The **Advertising Standards Authority** is not normally mentioned here and it is somewhat surprising to be advised that two QL suppliers have reported each other to the ASA. No member of the public is involved, apparently. **Digital Precision** sent copies of correspondence with the ASA concerning claims made about its advertising in *QL World* and of counter-claims by DP about the supplier making the complaints.

The total documentation is said to be extensive. In the letters supplied the claim made against DP was not upheld but two complaints made by DP against the other supplier were accepted as being valid.

SUPER BASIC

Some tricky trigonometry from Mike Lloyd as he continues his investigation into the graphics powers of the QL.

Trigonometry was not my best subject at school. Reviewing the lessons with the benefit of some self-taught geometry the difficulties seemed to stem from my failure to see the complete picture. Whether the fault was mine or my teacher's is impossible to say but that lack of insight remained until I discovered computer graphics.

The first piece of traditional trigonometry teaching which needed unpicking was the association of sines and cosines with triangles. Sines and cosines are attributes of angles. An angle is the space between two converging straight lines, whether they are edges of a triangle or the radii of a circle. The angle in figure one demonstrates both conditions simultaneously. The diagram also shows that sines and cosines are a link between a curve and the kind of grid system computers use to specify graphics locations.

People prefer to describe angles in terms of degrees but computers prefer radians, or arcs of a circle exactly the length of its radius. The ratio between the diameter of a circle and its circumference is expressed as *pi*, roughly 3.142. A radius is half a diameter and so roughly 6.28 radians will fit around the circumference of a circle. Radians are measured clockwise from the vertical and the large arrow in figure one extends for about 0.8 of a radian. A 50-degree angle is therefore 0.8 radians.

The QL has two functions to convert between radians and degrees. RAD takes a number of degrees as its argument and converts them into radians, while DEG does exactly the opposite. Programs will benefit if programmers adopt the preference of the computer for radians.

Sines and cosines are the graphics co-ordinates of points on the circumference of a circle. That contrasts sharply with traditional school teaching, which was that they were values looked up in a book. The X and Y axes have been annotated in figure one to allow the co-ordinates of the point where the 50-degree line meets the circumference to be read. More precise values can be obtained by asking the computer to print SIN(.8) and COS(.8).

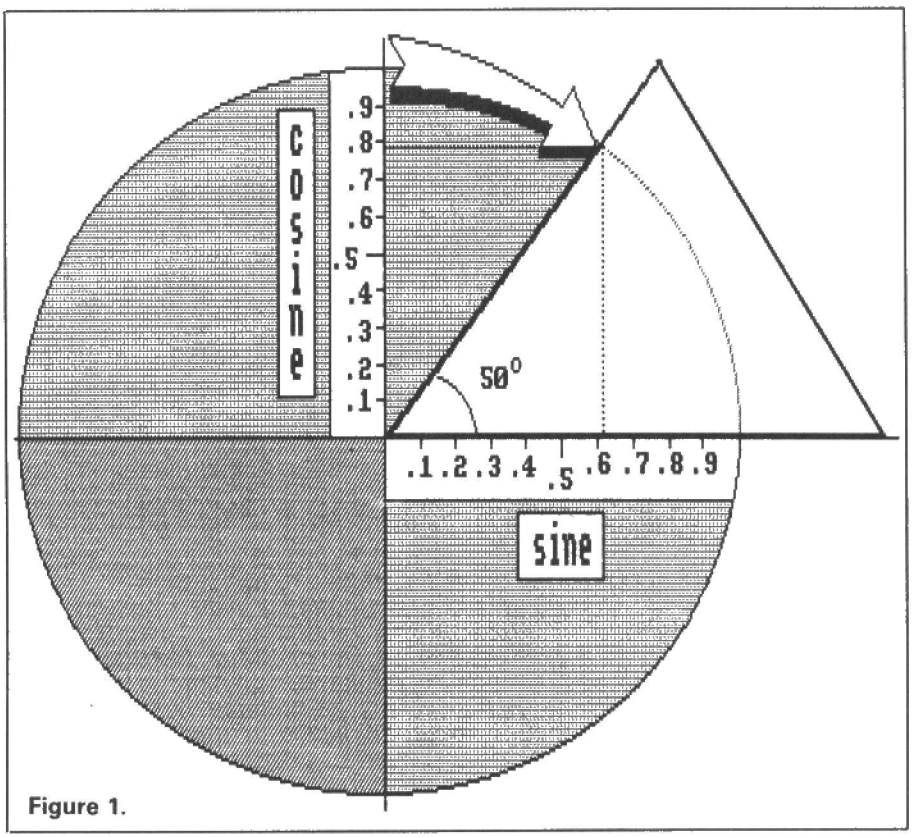


Figure 1.

Clockwise

Imagine a point travelling clockwise round the circumference of a circle. In the 12 o'clock position it would have a sine value of zero and a cosine value of one. At the start of its journey the cosine value of the point will change slowly while its sine value increases quickly. As the circumference slopes away its vertical component increases and its horizontal component decreases, so that towards the 90-degree point the cosine value is shrinking rapidly to zero while the sine value is slowly reaching 1.0.

As the point continues to move round the circle its sine value again starts to decrease towards zero. Its cosine value is now negative. Between the six o'clock and nine o'clock positions both values are negative and in the final quadrant the cosine value is positive and the sine value is negative.

When the point returns to its starting-place it has travelled 6.28 radians. It could begin a second circuit, in which case its radian value would continue to increase but the sine and cosine values would

```
Listing 1

100 DEFine PROCedure Moire
105 LOCal Loop, x
110 WINDOW 448, 200, 32, 16: PAPER 0: CLS
115 REPeat Loop
120   INK RND(255): OVER -1
125   FOR x = 0 TO 2*PI STEP 2E-2
130     LINE 75, 50 TO 75+70*SIN(x), 50+40*COS(x)
135   END FOR x
140 END REPeat Loop
145 END DEFine
```

always remain between plus and minus one. That is also true of the SIN and COS functions present on the QL. No matter how large the number passed to them they always return values between plus and minus one.

Plotting

Sines and cosines in computer graphics are valuable when plotting lines radiating from a point or for drawing arcs of a circle. The circle in figure one is centred on the graphics origin and has a radius of one graphics unit. To place the circle elsewhere and adjust its size, offsets and multipliers are needed, as used in listing one. Incidentally, listing one draws Moire patterns similar to those produced last month. By using different multipliers for cosine and sine values, ellipses can be drawn instead of circles.

The regularly undulating curves of sine waves are familiar in electronics and music. Listing two produces sine and cosine waves by plotting the motion of a point circumnavigating a circle on a horizontal (sine) axis and a vertical (cosine) axis. The curves are identical except that when one reaches its mid-point of zero on the scale the other is at its maximum positive or negative value.

Interactions between sine waves can produce attractive patterns which are now called Lissajous curves after the French physicist who discovered them. Listing three demonstrates how quickly and attractively the computer can reproduce plots which once took mathematicians days to calculate.

```
Listing 3

300 DEFine PROCedure Liss
304 LOCal a, b, A_Loop, B_Loop, x, y, z
308 WINDOW 480, 240, 16, 16: PAPER 0: BORDER 4, 3
312 REPeat A_Loop
316   x = RND(10): y = RND(10): z = RND(8): CLS
320   REPeat B_Loop
324     FOR n = 0 TO 200 STEP .4
328       a = 75 +65 *SIN(z +x *PI *n /100)
332       b = 50 +40 *SIN(y *PI *n /100)
336       FILL 0: FILL 1: INK RND(255)
340       CIRCLE a, b, 4
344       key = CODE (INKEY$)
348       SELect ON key
352         =  0: REMark continue
356         = 27: RETurn
360         = REMAINDER : EXIT B_Loop
364       END SELect
368     NEXT n
372   END REPeat B_Loop
376 END REPeat A_Loop
380 END DEFine
```

```
Listing 2

200 DEFine PROCedure SineWaves
204 LOCal Loop, x, ypos, xpos
208 WINDOW 400, 200,  40, 20: BORDER 2, 2: CLS
212 WINDOW 314, 200, 126, 20: BORDER 2, 2: CLS
216 WINDOW 400, 140,  40, 80: BORDER 2, 2
220 WINDOW 400, 200,  40, 20: INK 4: BORDER 2
224 SCALE 200, 0, 0: CSIZE 2, 1
228 INK 4: CIRCLE 30, 170, 30: OVER -1
232 CURSOR 180,   6: PRINT "SIN"
236 CURSOR  42, 140: PRINT "COS"
240 LINE 30, 170 TO 400, 170
244 LINE 30, 170 TO  30,   0: INK 7
248 REPeat Loop
252   FOR x = 0 TO 2*PI STEP .1
256     xpos =  30 + 30 *SIN(x)
260     ypos = 170 + 30 *COS(x)
264     LINE 30, 170 TO xpos, ypos
268     CIRCLE 70 +25 *x, ypos, 2
272     CIRCLE xpos, 140 -20 *x, 2
276     LINE 30, 170 TO xpos, ypos
280   END FOR x
284 END REPeat Loop
288 END DEFine
```

Heart

The heart of the routine comprises two nested loops. In the outer loop three random values are selected to represent harmonic motions. The inner loop then plots the curves until a key is pressed to start the sequence with a new set of values. The constants in lines 328 and 332 can be altered to change the location and size of the domain of the pattern.

The shapes produced by the program vary from very dull straight lines through slightly more interesting ellipses to some attractive waveforms and a passable imitation of a Staffordshire knot. Lissajous curves can be investigated methodically by re-writing the program slightly to remove the random element. Chaotic patterns are mixed with remarkably orderly patterns and small changes in value can have dramatic changes on the type of pattern produced.

Returning quickly to Newtonian regularity, listing four draws any regular polygon with the use of sines and cosines. The procedure has formal parameters representing the x and y co-ordinates of the first point of the polygon, the number of sides it has, the length of each side and the angle at which the polygon is to be drawn.

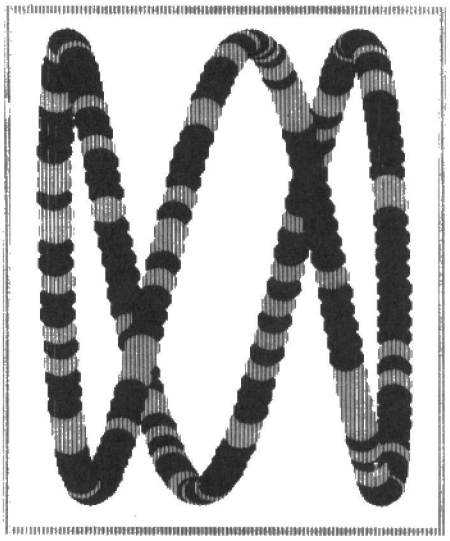
The procedure centres on a FOR . . .NEXT loop, repeated for each point of the polygon, in which a line is drawn relative to the current position of the imaginary graphics cursor. The vector of the line is determined by the radian value of the next point to be plotted.

Used once, the results of the procedure are interesting to geometricians but, when calls are repeated with perhaps just one or two slight variations in the paramaters, the possibilities for attractive patterns are almost endless. Two examples are listed after the procedure.

The two-dimensional nature of the screen and its co-ordinate systems makes it difficult to produce images with some impression of depth. One way is to use "false perspective" in which parallel lines remain parallel to each other but right-angles are distorted to give the illusion of three dimensions. The SuperBasic graph project published in spring, 1988 used this method to create solid-looking three-dimensional graphs.

The value of sines and cosines in this instance is that they can be used in vectors, a vector being an expression of both direction and distance. Listing five produces a visual illusion familiar to psychology students which was written to provide a visual aid for a lecture series on perception.

The routine needs to create long and exactly parallel sloping lines. It would have been possible to trace the image on to graph paper and calculate the co-ordinates for the end of each straight line but this is inflexible and lengthy to design and program. Instead, cosines were used to determine the angle of slope. Absolute graphics locations were specified for the circles at the end of the prongs and the left-hand ends of the lines leading from them. The horizontal positions of the right-hand ends of the sloping lines were also absolute values, leaving only the vertical position of those points to be calculated using cosines. Various angles were tried to maximise the sense of solidity. The shorter cross-lines were less critical to the illusion and their locations were guessed by trial and error.



Listing 4

```
400 DEFine PROCedure Shape (x,y,sides,size,Angle)
404 LOCal n
408 LINE x, y
412 FOR n = 0 TO 2 *PI -1E-2 STEP 2 *PI /sides
416 LINE_R TO size*COS(Angle+n),size*SIN(Angle+n)
420 NEXT n
424 END DEFine Shape
428 :
432 REMark ***   Example #1   ***
436 WINDOW 448, 200, 32, 16: CLS
440 FOR n = 0 TO 2*PI STEP 5E-2
444   INK RND (255)
448   Shape 80, 50, 5, 30, n
452 END FOR n
456 :
460 REMark ***   Example #2   ***
464 WINDOW 448, 200, 32, 16: INK 2,4: CLS
468 FOR j = 1 TO 12
472   FOR k = 0 TO 5
476     OVER -1: FILL 0: FILL (j>6)
480     Shape j*11, k*14, 8, 10, 0
484   END FOR k
488 END FOR j
```

Pie chart

The final pair of listings produce a useful pie chart and include one or two small surprises. Data handling has been simplified to keep the listings compact. The information used by the pie chart is placed in two arrays and a string variable. The arrays impose a sensible maximum limit of 10 segments. The values being graphed are not restricted to percentages.

After clearing a window and printing

Listing 5

```
500 DEFine PROCedure Prongs
505 LOCal x, y, Lyne
510 WINDOW 448, 200, 32, 16
515 SCALE 100, 0, 0: RESTORE 580
520 BORDER 2, 2: PAPER 0: INK 7: CLS
525 FOR x = 10, 20, 30
530   CIRCLE x, 40 -x, 4, .7, 0
535   FOR y = 0, 8
540     READ Lyne
545     POINT x, 36 -x +y
550     LINE_R TO Lyne, Lyne * COS(1)
555   END FOR y
560 END FOR x
565 LINE 100,82  TO  122,64  TO  122,56
570 LINE 100,60  TO   94,64  TO   94,72
575 LINE TO 107,63
580 DATA 85, 90,  87, 74,   92, 92
585 END DEFine
```

the title the routine adds all the values so that it can divide the pie proportionally and, incidentally, discover how many of the array elements are in use. Calculations are made in a loop to determine the start and finish angle of each segment. The variable *Sweep* moves by increments from 0, representing the 12 o'clock position of the pie, to *2pi*. Each jump is found by dividing the value of the current slice by the total value of all slices and multiplying this by *2pi*.

The presence of the ABS function discloses one of the secrets of the pie chart. All pie chart values must be positive if the display is to make any sense. The ABS function leaves positive numbers untouched and converts negative numbers to their absolute, positive, value. Negating a number can therefore be used to flag some special condition and in this example it is used to highlight a value. Slices of pie charts are often highlighted by slightly withdrawing the slice from the rest of the pie. Calculating the direction in which the slice is to be withdrawn is a problem which can be solved only by trigonometry.

The *Segment* procedure at listing seven accepts four parameters representing the start and end of each slice, a flag to indicate whether slices are highlighted or not, and a text label. The necessary calculations have been spread among the program lines; otherwise the line-drawing commands would have become impenetrably massive. First, the start and finish values were converted into radians by the calling routine. Second, the graphics scale is set so that the centre of the uncut pie is at graphics location (0, 0), thus removing the need for offsets.

Third, the position of this point on the screen is moved when a slice is to be highlighted. Line 730 keeps the same overall scale but the window origin – normally (−100, − 70) – is shifted in the opposite direction to the mid-point line of the highlighted slice.

Outline

The three line-drawing commands are called once to fill the slice with colour and again to outline it with a white border. The first line is a conventional radius. The next is an arc which must curve exactly the correct amount and extend to exactly the correct point on the circumference of the pie.

To calculate the exact curvature of the arc an understanding of the relationship between arcs and circles is needed. The ARC command is identical to the LINE command, except that it takes an additional parameter representing its distortion from a straight line. A curvature of zero produces a straight line, a positive value curves the line to the right and a negative value curves the line to the left. "Left" and "right" are relative to the direction of travel of the graphics cursor. Curvature is measured in radians, so an arc with a

```
Listing 6

600 DEFine PROCedure PieGraph
605 LOCal Total, Slice, Items, Sweep
610 WINDOW 448, 200, 32, 16: PAPER 0: CLS
615 BORDER 1, 2: INK 7: PRINT \ Title$
620 Total = 0: Sweep = 0
625 FOR Items = 1 TO 10
630   IF Value(Items) = 0: EXIT Items
635   Total = Total + ABS(Value(Items))
640 END FOR Items
645 FOR Slice = 1 TO Items -1
650   INK 19*Slice
655   Endsweep = Sweep + ABS (Value (Slice))
      / Total * 2*PI
660   Segment Sweep, Endsweep, (Value(Slice)
      < 0), Note$(Slice)
665   Sweep = Endsweep
670 NEXT Slice
675 END DEFine
```

```
Listing 7

700 DEFine PROCedure Segment (start, finish,
                              Flag, Label$)
705 LOCal Mid, x
710 Mid = start + (finish - start) /2
715 IF Flag = 0
720   SCALE 140, -100, -70
725 ELSE
730   SCALE 140, -100 -10*SIN(Mid),
      -70 -10*COS(Mid)
735 END IF
740 FOR x = 1, 0
745   FILL x: IF NOT x: INK 7
750   LINE 0,0 TO 50*SIN(start), 50*COS(start)
755   ARC TO 50*SIN(finish), 50*COS(finish),
      (start-finish)
760   LINE TO 0,0
765 END FOR x
770 CURSOR 60 * SIN(Mid), 60 * COS(Mid),
    -6 * LEN(Label$) * (SIN(Mid) <0), 0
775 PRINT Label$
780 END DEFine
```

```
Listing 8

800 REMark ***   Example Piegraph   ***
810 DIM Value(10), Note$(10,8), Title$(30)
815 RESTORE 840: READ Title$
825 FOR Slice = 1 TO 5: READ Note$ (Slice)
830 FOR Slice = 1 TO 5: READ Value (Slice)
835 PieGraph
840 DATA " Road Usage 1989"
850 DATA "Cars","Vans","Buses","Bikes","Trucks"
855 DATA   50,    30,    80,    -40,      50
899 STOP
```

curvature of *pi* is a semicircle. The following two commands draw a circle:

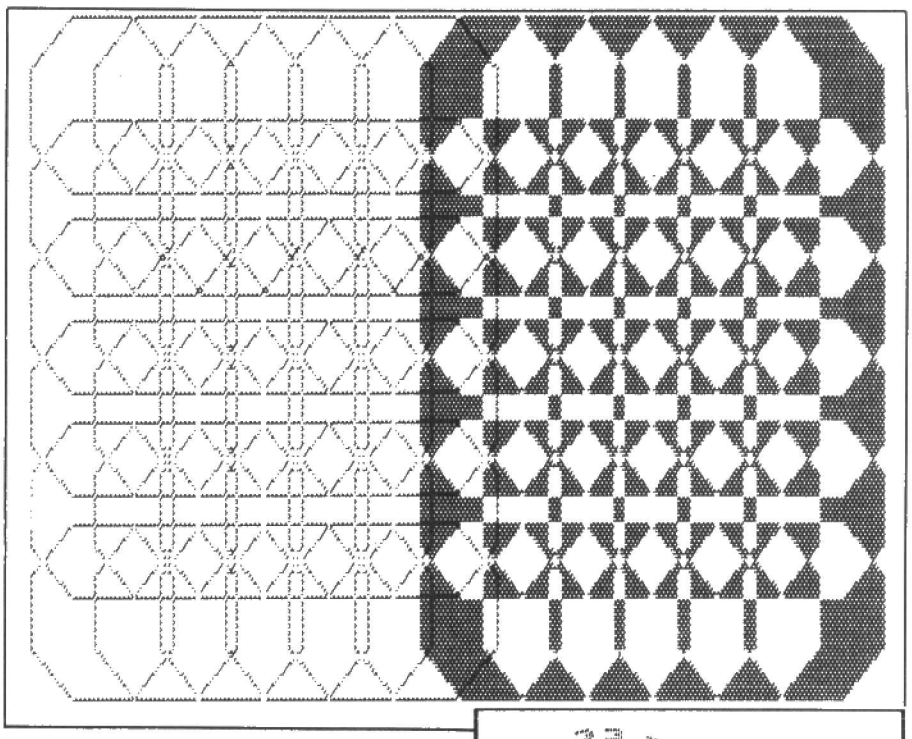
```
100 ARC 20, 20 TO 80, 80, PI
110 ARC 20, 20 TO 80, -PI
```

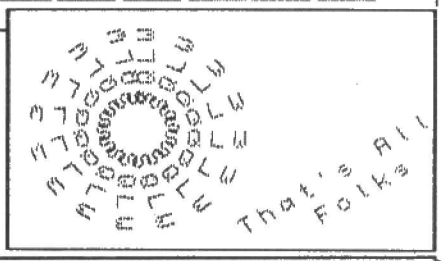
The curvature of the arc of a pie slice is equal to the difference between the start and finish values. This amount is negative to bias the curve in a clockwise direction.

Labelling the slices poses a final problem because on the right-hand side of the pie the label must begin near to the circumference, while on the other side of the pie it is the end of the label which must be adjacent to the circle. Fortunately the CURSOR command, as implemented on all but the earliest ROMs, permits two sets of co-ordinates to be specified, the first being a graphics location and the second an offset from that position measured in pixels.

The first pair of co-ordinates in this instance marks a point on an imaginary circle sharing the same centre as the pie. The second pair are set to zero unless the sine value is negative, indicating the right side of the pie. In that instance the offset is calculated by multiplying the length of the label by the width of the characters in pixels. Readers working in TV mode should change the 6 to 12 to accommodate the wider characters in CSIZE 2,0.

If your screen dump routine does not draw perfect circles the pie can be made slightly elliptical by changing the cosine multiplier. A value greater than 50 produces a tall ellipse, one less than 50 produces a squat one. The final nicety is that pie slices can be rotated to new locations by varying the initial value of *Sweep* between zero and *2pi*.





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SOFTWARE FILE

INFORMATION:
Program: International Cricket (256K)
Price: £4.99
Supplier: Nigel Holder, 25 Beightons Walk, Rochdale, Lancashire OL12 6EA.
Tel: 0706 39554

Dave Watson succumbs to click of willow on keyboard.

Imagine the scenario. Ranged against your feeble English is the might of the Australian team. They are out to skittle your batting and then thrash the bowling round the ground without mercy. Do you remember last summer? It sounds familiar?

On loading *International Cricket* a menu allows you to alter game parameters. Once satisfied, you toss to decide who is to bat. Then the game proper is under-way.

During play the display alternates between two screens. The first shows the wicket with the batsman about to receive strike. Once the ball has been played the second screen gives a bird's-eye view of the ground with the wicket at the centre. The fielders and batsmen are represented as coloured dots. On the left of both screens are the scoreboard and a picture of the current state of the wicket – either intact or shattered. Although both batting and fielding use the same keys – except in the player v. player game – those keys produce different results in either mode.

As soon as you are ready you initiate the opposing bowler's run-up. While at the crease you have six strokes at your disposal – Cover Drive, Straight Drive, On Drive, Square Cut, Pull and Hook. Once you have played your shot and the screen of the field is displayed you start your batsmen running between the wickets.

As your bowler releases the ball, a combination of keypresses will affect his delivery. The ball may be directed at one of the three stumps and may be a pitched-up or short-pitched delivery. Thus six lines of attack may be attempted. As with the batting stroke, the timing of the keypresses is crucial. Too early or too late may have disastrous results.

To complicate things further there is a display which shows how much swing your bowler will apply and the amount of seam or deflection which will be imparted. Two thin bars indicate the direction of swing or seam.

After the stroke the display returns to the bird's-eye-view and you must field the ball. An indicator on the right shows the height of the ball. Your fielder is either red, which means the ball is too fast for him, or blue, which indicates that he can stop or catch it.

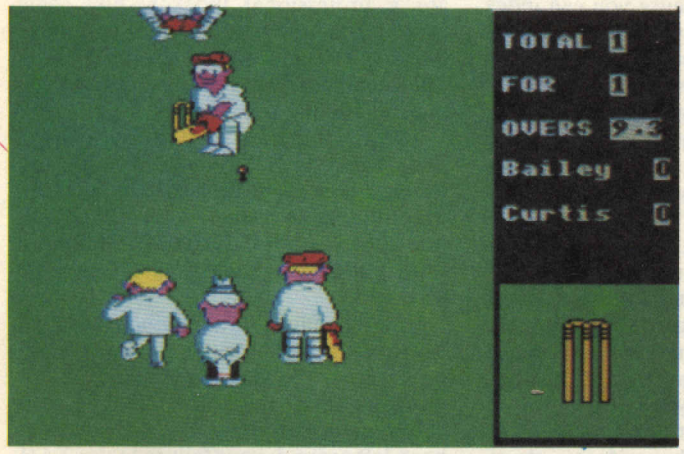
International Cricket is very well-presented. I like particularly the animation of the batting screen. The fielding display is perhaps less successful but it is difficult to envisage how it might be improved. The different phases of the game are neatly and economically driven – no complaints there.

What drives me to distraction is the difficulty level of the game. I find it disconcerting as wickets fall one after the other for no runs. My highest score to date is 31 all out – and 12 were extras. Could there be room for a novice level in a future version?

Fielding proves equally frustrating. Unlike the Australian fielders who zip around with alacrity, never dropping a catch, mine cannot catch a cold. The Australian scoreboard ticks over in fours and sixes. There is scant documentation with the game and no indication of how one might apply the mysteries of seam and swing to your bowling – it is for you to work that out.

There is also a point of game logic which I question. If your fielder is red – i.e., the ball is moving too fast for him – and he positions himself exactly where the ball bounces, surely he could stop it, despite the possible painful results? Not so. It bounces off him en route for another boundary. My best fielding so far is three wickets for 98 runs in the 10-over game.

That said, the game has a curious addictive quality – just like the real thing. Perhaps an addiction to the real thing is necessary before you will devote the time to mastering International Cricket at the keyboard. As for me, I am off to the nets for another practice session.



INDEXER

John Watson presents the benefit of his experience on the time-consuming subject of indexing.

Indices are boring – compiling them, that is – but as a full-time publisher and part-time textbook author I can assure you that the job is a necessary evil. In the days of hot metal type, indices were put together using postcards and a large table. When a book was typeset and had been organised into pages, page proofs were printed. The indexer would use the proofs and the cards and make the index roughly as follows.

A postcard is made for the first occurrence of the first entry to go in the index, along with the page number. Then a card is made for the second entry, then the third, and so on. The cards have to be kept in strict alphabetical order. Before making each new entry the indexer checks to see if there is already a card for it and, if there is, adds the new page reference to the card. Eventually, there will be a big stack of cards in alphabetical order, each card with an entry on it, none duplicated, and some cards have more than one page reference. Finally, the whole thing is typed and checked.

These days the professionals use computers and purpose-written software to do the job more easily but they still usually work from the page proofs. The reason is that 'real' publishers scarcely ever use desk-top publishing systems.

Authors

Now and again, you find an author who has an industry-quality DTP system, a working knowledge of typography and page design, a laser printer with the correct fonts and sufficient time to do the typesetting as well as write the book – but not often. So the publisher will ask the author for an ASCII disc which the printer – publishers usually do not do their own printing – will spool into the typesetting machine. That means that the indexing facilities on even sophisticated word processors like *WordPerfect* are fairly irrelevant because they can give only the page reference in the typescript. What is needed is the page reference on the page proofs, which will be completely different. That is the reason I wrote the *Indexer* program for the QL.

Why am I using a QL? I suppose it is a matter of familiarity. At my office we have networked IBM ATs running WordPerfect 5 and at home I have a QL and a Zenith portable PC clone for easy compatibility with the office system. When I am doing something I think will not have to be continued at work I tend to use the QL.

It is a straightforward system – just the QL, fitted with a Schön keyboard and a Miracle Systems Expandaram giving 640K. I use 2.3 Turboquill+ and the other Psion programs as necessary but always in RAMdisc mode which avoids Quill having problems with the Microdrives.

Microdrives have proved as reliable as discs when used in this way. I do not use a QL disc but can copy files across the RS232 link to the Zenith if I need them in IBM format.

Why do I not use the order facility on Abacus or an ordered file in Archive? Because those programs sort only on the basis of the first eight characters. That means that entries like electronic computer, electronic component, electronic organ and electronic data processing would appear in random order. A specially-written program can also save the trouble of combining identical entries manually.

You can, of course, use Indexer to index things other than books. It is often useful to have your own index of journals and magazines, collections and documents of all kinds because you can index the things to which you want to refer again, rather than what someone else thought you would want to look up.

To use Indexer, begin by typing-in the index from your page proofs or whatever, using Quill. Clear all the TAB settings, then set just one TAB – the default – about two-thirds of the way across the page. That will divide the index entry from the page number. Starting at page one – sensible but not essential – of the proofs or whatever you are indexing, type-in each entry, hit TAB, then type-in the page number. Work your way through the book until you reach the end.

Do not worry about duplicated entries or the order in which you enter them. Make sure you begin at the top of the page, as Indexer assumes that the first character of the document is the first letter of the first index entry. A portion of your work on Quill might look something like this:

```
Electron                16
Electron volt           17
Electric field          17
Atomic structure        17
Shell                   18
Electron gun            19
Television              19
Phosphor                20
Electron                37
Electric field          37
Magnet                  38
Electron                42
Magnetic field          58
```

The page numbers are in order because that is the best way to avoid getting lost in the proofs but there is no other reason for them to be, as they will be sorted later.

There are some limitations but none which is likely to be met by merely mortal writers. Indexer holds the entries in an array. The array is defined by the number of entries and the length of longest entry. With an expanded QL the practical limit is somewhere about 12,000 entries of typical maximum length 50 characters – the index should not be longer than the book – and even the 128K QL has room for more than 2,000 entries of this length.

Indexer also assumes that the page number will be no more than four digits. Indexer is designed for simple indices; if you have written a book which needs a multi-level index you might be better employing a professional indexer. If you are a professional indexer, buy some commercial software. When you have done, SAVE the file in the usual way. Then load Indexer. The main menu will appear, slightly reminiscent of Quill.

The first thing you need to do is load the file. Press 'L'. You will have to tell Indexer how many entries there are and how long the maximum entry length is; it does not matter if you over-estimate a little but huge over-estimates slow the sorting.

Enter the filename as instructed and, all being well, the file will load and you will be returned to the main menu. Error messages at this stage are probably due to TABs or non-printing characters having been left around; your failure to use TAB to get to a page reference, or your inability to count. START followed by <ENTER> always re-starts the program.

Pressing 'S' saves the array as an '_exp' file which can be loaded back into Quill if you want to do so. The array can be saved either before or after sorting. Pressing 'O' from the main index puts the entries into alphabetical order. The earlier index now looks like this:

```
Atomic structure        17
Electric field          17
Electric field          37
Electron                16
Electron                37
Electron                42
Electron gun            19
Electron volt           17
Magnet                  38
Magnetic field          58
Phosphor                20
Shell                   18
Television              19
```

You can press 'P' to print the index; this prints all the entries but closes the spaces betweeen the entry and page number. This is the result:

```
Atomic structure  17
Electric field  17
Electric field  37
Electron  16
Electron  37
Electron  42
Electron gun  19
Electron volt  17
Magnet  38
Magnetic field  58
Phosphor  20
Shell  18
Television  19
```

More likely you will want to combine the index entries – 'C' from the menu. For both the 'Print' and 'Combine' options you are given a choice of output – an '_exp' file, printer (ser1), or screen. Whichever you choose, the result, from the sorted index in the second list now looks like this:

```
Atomic structure  17
Electric field  17, 37
Electron  16, 37, 42
Electron gun  19
Electron volt  17
Magnet  38
Magnetic field  58
Phosphor  20
Shell  18
Television  19
```

The program is written in standard SuperBasic – no toolkits. I apologise for the style. I like the fact that SuperBasic is procedural but, being set in my ways, still cannot get out of the habit of putting in the occasional 'GOTO'.

The procedure loop is the main program-calling *menu* which sets the windows and draws the screen, on each lap. I suppose *menu* is something of a luxury, with all that line drawing but there is a warm glow with using software which looks good as well as works properly. Procedure *getfile* loads the Quill '_doc' file into the array. *REPEAT in* is worth mentioning; it finds the beginning of the index by reference to the text string "page" in the file header, which is always the same number of characters from the start of the text.

Quill uses ASCII 9 as TAB, ASCII 0 as an end-of-line marker, and the sensible part of '_doc files ends with ASCII 14, so this is used to locate the end of the index. Each line of the array is first filled – see the note at the end of this section – and the entry copied over it. Procedure *number* loads the page reference number into the last four characters at the end of the line, ranged right to ensure proper sorting.

Procedure *sort* is a general-purpose sort routine, full of GOTOs but reasonably fast for Basic. it sorts the array into ASCII order by comparing lines of the array and finishes with the highest entry in the sorted list (Zygote?) in the highest numbered line of the array. Blank lines finish as the lowest-numbered lines, before Aardvark.

Procedure *saving* opens a new file, adds the suffix '_exp' and saves the array to Microdrive or disc, skipping over any blank lines. Procedure *combine* is a little more convoluted. *REPEAT in2* finds the first entry in the array – remember there may be some spaces. *REPEAT entry* is the main loop which assembles each line of the completed index in t$ before printing it. Working on each line of the array, procedure *collapse* gets rid of the spaces following the entry proper. Procedure *reference* adds the page number.

Variables

Two pointed variables, *a* and *e* are used, *e* generally pointing to the line in the array following the current one pointed to by *a*. Adjacent lines of the array are compared, except for the last four characters – the page reference; if they are identical, procedure *join* is called to add the second and, if necessary, subsequent page reference(s) to t$. Procedure *choose* selects the output for the 'print' or 'combine' options.

There is something very sinister about the way my QL compares strings. Procedure *sort*, which works perfectly in GWBasic or even Spectrum Basic, did not work on the QL. Investigation showed that A$-" ":b$-"a":PRINT A$>B$ gives the answer '1'. Both my QLs – ROM version AH – think that the ASCII 'space' has a higher value than any of the letters or numbers. That leads to a very strange ASCII sort. Fortunately, and even more mysteriously, the QL also believes that A$= CHR$(186) : B$="a" : PRINT a$>B$ should give the answer 'O'. I was so puzzled by this that I contacted my friend Colin Opie who spent time confirming that the problem exists – and on ROM version JM as well as AH. If you have a ROM other than those two – the only ones checked – you can test your QL with the foregoing two lines of program.

The practical result is that all the spaces in the array have to be replaced with CHR$ (186)s for sorting; then, when printing or saving, swapped for spaces again. Lines 890, 910, 1390, 2020 and the procedure *change* – along with its calls from lines 1100, 1740, 1830 and 2500 – do this. If you have a ROM without the bug, those lines will need to be modified, CHR$(186) becoming CHR$(32), except for the last of the three statements in line 910 which should be deleted, as should *change* and its calls. That could speed printing noticeably.

To keep the program fairly short I have included no error trapping. You can crash Indexer by entering a letter when it is expecting a number, by saving to a file which already exists, saving or printing to a non-existent device, or under-specifying the array.

All those things can be trapped and would be in a commercial piece of software. Someone familiar with QL assembly language and the Quill file header could no doubt make it pick up the array size from the Quill file but, as it stands, Indexer is at least robust. If it falls over, START and <ENTER> gets it going again without loss of the data but you always have the Quill file to fall back on if something irrecoverable, like hitting CTL and SPACE during sorting, happens.

● John Watson is computing publisher for Springer-Verlag, an international publishing house specialising in scientific, technical and medical books. He has written several textbooks, including *Introductory Electricity and Electronics*, *Cost-effective Electronic Construction*, and *Mastering Electronics* (Macmillan), currently in its second edition.

```
100 REMark Indexer by John Watson
110 ms=0
120 REPeat loop
130   menu
140   k$=INKEY$(-1)
150   IF k$=="C"
160     IF ms<>0
170       choose
180       combine
190       ELSE check
200       END IF
210     END IF
220   IF k$=="L"
230     getfile
240     END IF
250   IF k$=="O"
260     sort
270     END IF
280   IF k$=="P"
290     IF ms<>0
300       choose
310       printing
320       ELSE check
330       END IF
340     END IF
350   IF k$=="S"
360     saving
370     END IF
380   END REPeat loop
```

```
390 DEFine PROCedure menu
400 MODE 4
410 PAPER#0,0:INK#0,2:BORDER#0
420 OPEN#1,con_440x160a40x50
430 OPEN#2,con_440x160a40x50_128
440 PAPER#2,0:INK#2,5:BORDER#2
450 OPEN#5,scr_440x40a40x6
460 INK#5,7:PAPER#5,0
470 CLS#5
480 LINE#5 TO 0,100 TO 830,100 TO 830,0
    TO 0,0
490 LINE#5; 130,0 TO 130,100
500 LINE#5; 700,0 TO 700,100
510 LINE#5; 700,50 TO 830,50
520 CURSOR#5;4,5
530 INK#5,5:PRINT#5;"Select by":
    CURSOR#5;12,16:PRINT#5;"typing":
    CURSOR#5;10,26:PRINT#5,"initial"
540 CURSOR#5;380,5
550 INK#5,2:PRINT#5,"INDEXER":INK#5,5:
    CURSOR#5;374,25:PRINT#5,"(c)JW
    1989"
560 CURSOR#5, 80,5
570 INK#5,7:PRINT#5;"COMMANDS"
580 CURSOR#5;80,15:INK#5,5
590 PRINT#5;" Combine        Load fil
    e      Order index  ":CURSOR#5,80,
    25:PRINT#5;" Print index    Save i
    ndex              "
600 PRINT\\\\"COMBINE          Combines
    identical index entries and lists"
    \"                  their page
    numbers"
610 PRINT\"LOAD FILE        Loads a
    Quill '_doc' index file from mdv2_"
620 PRINT\"ORDER INDEX      Sorts the
    current index into alphabetical
    order"
630 PRINT\"PRINT INDEX      Prints the
    contents of the current index"
640 PRINT\"SAVE INDEX       Saves the
    current index to mdv2_ as an '_exp'
    file"
650 END DEFine menu
660 DEFine PROCedure getfile
670 warning
680 AT 6,1:INPUT "Enter the maximum
    length of the entries (in charac
    ters): ";maxl
690 AT 8,1:INPUT "Enter the maximum
    number of entries in the index:
    ";maxn
700 AT 10,1:INPUT "Enter the drive and
    file name (e.g., mdv2_filename):
    ";text$
710 CLS
720 ms=0
730 DIM a$(maxn, maxl)
740 text$=text$&'_doc'
750 OPEN_IN#3,text$
760 AT 8,6:PRINT "Loading Quill
    file..."
770 k$=''
780 REPeat in
790   k$=k$&INKEY$(#3)
800   IF LEN(k$)>4
810     IF ("page" INSTR k$)<>0 THEN
    EXIT in
820     END IF
830   END REPeat in
840 FOR i=1 TO 5
850   k$=INKEY$(#3)
860   NEXT i
870 x=1
880 REPeat filler
890   k$=FILL$(CHR$(186),maxl):e$=''
900   REPeat build
910     t$=INKEY$(#3):k=CODE(t$):IF
    k=32 THEN t$=CHR$(186)
920     IF k=9
930       k$(1 TO LEN(e$))=e$
940       number
950       EXIT build
960       END IF
970     IF k=14 THEN EXIT build
980     IF (k<32 AND k<>9 AND k<>14 AND
    k<>0) OR k>191 THEN problem

990     e$=e$&t$
1000     END REPeat build
1010   IF k=14 THEN EXIT filler
1020   a$(x)=k$:k$='':x=x+1
1030   END REPeat filler
1040   CLOSE#3
1050 END DEFine getfile
1060 DEFine PROCedure saving
1070 warning
1080 filesave
1090 FOR x=1 TO maxn
1100   IF a$(x)<>"" THEN k$=a$(x):
     change:PRINT#2,k$
1110   NEXT x
1120 END DEFine saving
1130 DEFine PROCedure warning
1140 INK#5,7
1150 CURSOR#5;80,5
1160 PRINT#5;"  If the program stops
     with an error message,"
1170 CURSOR#5;80,15
1180 PRINT#5;"  restart it with START
     <ENTER>.              "
1190 CURSOR#5;80,25
1200 PRINT#5;"
                 "
1210 INK#5,5:CLS
1220 CURSOR#5;4,5
1230 PRINT#5,"          ":CURSOR#5;12,
     16:PRINT#5,"      ":CURSOR#5;10,
     26:PRINT#5,"       "
1240 END DEFine warning
1250 DEFine PROCedure number
1260 n$=''
1270  REPeat loadnum
1280   t$=INKEY$(#3)
1290   IF CODE(t$)=0 THEN EXIT loadnum
1300   n$=n$&t$
1310   END REPeat loadnum
1320 q=LEN(n$)
1330 FOR s=q TO 1 STEP -1
1340   k$((maxl+1)-s)=n$((q+1)-s)
1350   NEXT s
1360 END DEFine number
1370 DEFine PROCedure change
1380 FOR i=1 TO LEN(k$)
1390   IF CODE(k$(i))=186 THEN k$(i)
     =" "
1400   NEXT i
1410 END DEFine change
1420 DEFine PROCedure sort
1430 warning
1440 CLS#0:AT 8,0:PRINT "Ordering
     index. This may take several
     minutes for large indexes..."
1450 c=0:s=0:a=1
1460 n=maxn
1470 IF 2^a>n THEN GO TO 1490
```

```
1480 a=a+1:GO TO 1470
1490 f=2^a-1
1500 f=INT(f/2)
1510 IF f=0 THEN k$="":ms=1:RETurn
1520 d=n-f:b=1
1530 a=b
1540 e=a+f:c=c+1
1550 IF a$(a)>a$(e) THEN GO TO 1590
1560 b=b+1
1570 IF b>d THEN GO TO 1500
1580 GO TO 1530
1590 s=s+1
1600 t$=a$(a):a$(a)=a$(e):a$(e)=t$:
     a=a-f
1610 IF a<1 THEN GO TO 1560
1620 GO TO 1540
1630 END DEFine sort
1640 DEFine PROCedure combine
1650 warning
1660 PRINT#0,"Combining index entries
     ..."
1670 a=1
1680 REPeat in2
1690   IF a$(a)<>''THEN EXIT in2
1700   a=a+1
1710   END REPeat in2
1720 e=a+1
1730 REPeat entry
1740   k$=a$(a):change:t$=k$
1750   collapse
1760   reference
1770   IF e>maxn THEN EXIT entry
1780   IF a$(a, 1 TO maxl-4)=a$(e, 1 TO
     maxl-4) THEN join
1790   IF e>maxn THEN GO TO 1860
1800   PRINT#2,t$
1810   a=a+1:e=a+1
1820   END REPeat entry
1830 k$=a$(a):change:t$=k$
1840 collapse
1850 reference
1860 PRINT#2,t$
1870 CLS#0:PRINT#0,"FINISHED. Press
     SPACE for the menu."
1880 k$=INKEY$(-1)
1890 END DEFine combine
1900 DEFine PROCedure collapse
1910 t$=t$(1 TO LEN(t$)-4)
1920 i=maxl-4
1930 REPeat shrink
1940   IF CODE (t$(i))<>32 THEN EXIT
     shrink
1950   t$=t$(1 TO LEN(t$)-1)
1960   i=i-1
1970   END REPeat shrink
1980 t$=t$&'  '
1990 END DEFine collapse
2000 DEFine PROCedure reference
2010 FOR i=maxl-4 TO maxl
2020   IF CODE (a$(a,i))<>186 THEN t$=
     t$&a$(a,i)
2030   NEXT i
2040 END DEFine reference
2050 DEFine PROCedure join
2060 a=a+1:e=a+1
2070 t$=t$&', '
2080 reference
2090 IF e>maxn THEN RETurn
2100 IF a$(a,1 TO maxl-4)=a$(e,1 TO
     maxl-4) THEN GO TO 2060
2110 END DEFine join
2120 DEFine PROCedure problem
2130 CLS
2140 AT 6,0:PRINT "Unable to load the
     whole file. Go back to Quill and
     make the necessary"\"corrections,
     then re-save the file (as a '_doc'
     file) in the usual way."\\"Press
     ENTER to go on."
2150 k$=INKEY$(-1)
2160 CLS:k$=''
2170 RUN
2180 END DEFine problem
2190 DEFine PROCedure check
2200 CLS
2210 AT 6,0:PRINT "The index has not
     been ordered, and cannot be print
     ed or combined."
2220 CLS#0:PRINT#0,"Press SPACE for the
     menu."
2230 k$=INKEY$(-1)
2240 k$=''
2250 END DEFine check
2260 DEFine PROCedure choose
2270 CLS
2280 AT 8,0:PRINT "Output to screen,
     printer or file? Press 'S', 'P' or
     'F'."
2290 REPeat query
2300   k$=INKEY$(-1)
2310   IF k$=='S'
2320     CLS
2330     PRINT#0, "Use CTRL & F5 to pau
     se and release the screen display
     ."
2340     EXIT query
2350     END IF
2360   IF k$=='P' THEN OPEN#2,ser1:EXIT
     query
2370   IF k$=='F' THEN filesave:EXIT
     query
2380   END REPeat query
2390 END DEFine choose
2400 DEFine PROCedure printing
2410 warning
2420 a=1
2430 PRINT#0,"Printing index entries.
     .."
2440 REPeat in3
2450   IF a$(a)<>'' THEN EXIT in3
2460   a=a+1
2470   END REPeat in3
2480 FOR s=a TO maxn
2490 k$=a$(s)
2500 change
2510 PRINT#2,k$
2520 NEXT s
2530 k$=''
2540 CLS#0:PRINT#0,"FINISHED. Press
     SPACE for the menu."
2550 k$=INKEY$(-1)
2560 END DEFine printing
2570 DEFine PROCedure start
2580 RUN 120
2590 END DEFine start
2600 DEFine PROCedure filesave
2610 CLS
2620 AT 8,0:PRINT "Ready to save:"
2630 AT 10,0:INPUT "Enter the drive &
     file name (e.g. mdv2_filename):
     ";text$
2640 OPEN_NEW#2,text$&'_exp'
2650 CLS
2660 AT 8,6:PRINT "Saving ";text$;"_e
     xp"
2670 END DEFine filesave
```

QL-SCANNER

Mike Lloyd tests a peripheral which turns a printer into a digital scanner.

Desk-top publishing is becoming big business because it offers much of the power of large publishing organisations for a relatively small outlay. Take a personal computer like the QL, insert a substantial and competent page creation program such as the Digital Precision *Professional Publisher,* stir in some creative juices and for some people the result is a delight.

For others it can be more of a dog's dinner but, to be fair to DTP program writers, most of the mistakes are due to overdoing the creative juices. It takes much more than 512K of RAM and a laser printer to produce a graphics designer and most DTP novices cram text on to pages straining under fussy decoration and conflicting text styles without much thought for harmony, space, style and purpose. If you bake a pie with every ingredient in the kitchen it should be no surprise if the result is indigestible.

Until recently the paucity of good graphics was another disadvantage, with images usually being limited to simple clip-art and whatever people could produce with drawing utilities. A piece of hardware which makes all the difference in this respect is the image scanner, fast becoming a standard requirement for anyone interested seriously in DTP. The QL market now boasts a reasonably-priced scanner which produces images of very high quality.

A scanner is a device which detects light and shade on a sheet of paper, converts it into digital values and produces a screen display closely resembling the original picture. Two other similar pieces of equipment are often confused with scanners. The first is a digitiser, a mouse-like device which stores its co-ordinates when a button is clicked. Its main use is to convert maps, plans and technical drawings into computer-compatible data, a slow and boring task.

The other similar peripheral is an optical character reader; it is programmed to recognise certain typefaces and it can produce a fairly accurate ASCII-coded text file from a page of print. These are three devices which accomplish three different tasks and they should not be confused.

Scanners are invaluable to desk-top publishers who need to put complicated images into their work. For me that means everything more complicated than a triangle. Even when something like a company logo could be copied faithfully using a drawing program it might be faster to scan the image on to the screen. Computer artists will also appreciate being able to scan photographs or publications and use them as the basis for something original.

Copyright

Commercial users of scanners need to be aware of legal limitations imposed by the copyright laws. Just as it is illegal to copy portions of textbooks or to photocopy maps for sale it can be wrong to market scanned copies of protected images. Scanning is the graphics equivalent of sound sampling and probably is in the same grey area of the law. Recent judgments relating to music sampling seem to take into account the amount of sampling done, the use to which it is put, the profit made by it and the damage done to the reputation of the original. Similar rules will probably apply to image sampling. If in doubt, seek legal advice.

Even with the strictest interpretation of the law there are plenty of opportunities to scan pictures without acquiring a guilty conscience. Scanners are in all kinds of shapes, sizes and price categories. The biggest and most expensive are flat-bed scanners which look like small photocopiers and which swallow A4 or A3 sheets whole. Cheaper scanners are hand-held, looking rather like wide-angle bar code readers. A heavily-geared wheel ensures steady, accurate motion while the image is being digitised.

The cheapest design is based on a clever piece of lateral thinking. A major part of the cost of a flat-bed scanner is the mechanism which moves the scanning eye in a regular pattern over a page. The movement is exactly the same as that performed by a printer head; therefore most computer owners have the mechanics for a scanner already on their desks.

Juergen Falkenberg's *QL-Scanner* from Germany is designed to be mounted on a dot matrix printer and so the expense is limited to the scanning eye, the analogue-to-digital converter and the necessary software. As a result this £130 device can produce pictures at least as good as those provided by other scanners costing £1,000 and more.

When it is unpacked the QL-Scanner is a little disappointing because there is so little to see. The contents are a kludge containing CMOS circuitry for the ADC, a disc or Microdrive of software, two measurement leads and the scanning eye mounted on a generous quantity of cable. The QL must be powered down before the ADC can be placed in the ROM port and great care must be taken to prevent damage to the delicate circuitry and chips from static charges.

The measurement leads and some of the software turn the ADC into a voltmeter and the QL can even become an oscilloscope provided additional hardware is bought. Readers are requested to contact Falkenberg or his U.K. distributor for details of other products related to the ADC.

The pack should also contain a mounting device for the printer specified by the customer but one suitable for my printer

could not be found in time for the review. Instead, I removed the printer ribbon and Blutacked the scanner to the printhead. Although movement was restricted to slightly less than A4 width it proved to be a most acceptable solution.

The instructions are provided in an indifferent translation of the original German and so can be slightly difficult to follow but the basics are simple. The scanning head contains a photo-electric cell sensitive to reflected red light produced by a small bulb also mounted in the scanner head. Very fine adjustments to the sensitivity of the scanner and to its distance from the image are necessary to obtain the best results. The manual contains details of a brief type-in program which displays the scanner output while adjustments are made and which subsequently I discovered I did not need. When fitting the scanner for the first time it is important to ensure that the printhead trolley has unimpeded movement and that the scanner cable does not snag against any protrusion. For most printers, scanning will have to take place with the printer cover open. The scanning eye needs to be 4mm. from the paper and exactly perpendicular to it.

Sensitivity

The next step is to adjust the sensitivity of the eye and I found it needed doing every time I used the device. The best way to do this proved to be to ignore the manual instructions and to boot the scanner software. On one menu there is a digital readout of the intensity of signal being received. With the scanner set to maximum sensitivity and a plain sheet of white typing paper in the printer the head needs to be moved towards or away from the paper until the maximum reading is obained.

Then the paper should be removed and a reading taken from the black platen. A trim screw is adjusted with a small screwdriver until the readout shows zero. Setting up is then complete. With practice the whole operation can take two minutes or less.

In contrast to many other similar devices the QL-Scanner detects a series of grey tones rather than just black or white and you can adjust the scale of the scanning horizontally and vertically to concentrate on just part of an image. Other adjustments are necessary to synchronise the scanning speed with the speed of progress of the printer head across the page. After some frustrating fiddling relying more on guesswork than the advice in the manual I obtained very good results. The final settings can be stored in the boot program so that this process is necessary only once.

At least 256K of additional memory is essential to hold the huge data file collected when scanning a page and no other programs should be multi-tasked with QL-Scanner because that would upset the synchronisation between scanner and computer. Additionally, unless you own two printers it is awkward to scan and print in the same session. The most practical arrangement proved to be to spend an evening scanning a large number of images and storing them on disc as high-quality clip-art.

Scanning can be paused to allow parameters to be altered or to finish the scanning of a short image. A paused scan can be re-started or a new scan begun at the touch of a key. The time taken to scan depends on the size of the image, the chosen scale and the speed of your printer but a full screen display should take less than five minutes. If the source image cannot be fed into the printer it might be possible to use a photocopy.

In addition to producing a screen picture, the program stores the data obtained from the scanning eye, hence the need for copious quantities of memory. This means that the colour balance can be adjusted after scanning has been completed without the need to scan the original again.

A straightforward menu of "picture options" provides three variables which can be altered to produce different contrasts on the screen. Setting all three to the same value produces a monochrome image and changing that value changes the amount of detail being displayed. By setting the variables to three different values numerous grey scales can be introduced.

With the limited QL colour-handling ability it is no surprise that the rendering of colour pictures is not chromatically accurate, nor is it meant to be. The computer is representing degrees of brightness in different colours.

Pictures are produced initially in four-colour mode as a "negative" image. The "picture options" menu permits the image to be inversed and displayed in eight colours. When I first scanned a photograph I was quietly impressed by the result but on selecting the inverse option

to turn the "negative" into a "print" the unexpectedly strong feeling of three-dimensional depth and solidity was literally breathtaking.

File options allow screen dumps or the scanning data, typically 200K or more, to be saved for future use. Previously-saved scanner files can be re-loaded for further manipulation. Sadly, the lifelike veracity of the screen displays does not always survive being dumped to a dot matrix printer and so the printouts accompanying this article, good as they are, do not tell the whole story.

Experimenting

Experimenting is both essential and highly enjoyable. Glossy magazines are the best source of material but newsprint is acceptable. Pictures need to have strong contrasts if they are to translate well to the screen but skin tones are usually disappointing. That is due to the fact that red light is being shone on the image; a similar device for the Apple Macintosh computer uses green light to obtain the best skin tones. Cartoons and line drawings translate well and large characters can be borrowed for use in DTP packages. Small text, however, is fuzzy-edged and difficult to read.

Having captured the image the next logical step is to import it into a drawing utility like *Eye-Q* to clean up any imperfections or to transform it into something very different. It can then be moved to a DTP program for integration with a text file. None of the illustrations accompanying this article has been retouched or edited in any way.

The QL-Scanner might be a costly peripheral but it is manufactured with quality components assembled with German thoroughness and it represents tremendous value. The quality of the scanned images is as high as that produced by scanners costing 10 times as much and the software is highly-competent and easy to use. A scanner is an essential part of a desk-top publisher's armoury and the QL-Scanner is as good as any I have seen – and better than many. If you can afford it, buy one.

SOFTWARE FILE

INFORMATION:
Program: Report Writer
Price: £14.99
Supplier: Cottage Enterprises, 6 Shorwell Close, Grantham, Lincs. NG31 7LL. Tel: (0476) 67796

Bryan Davies examines the performance of an aid to teachers.

Writing reports is very much a daily business in some jobs, yet many of us start each report as if it was a completely new activity, to be thought out from scratch. That approach may be good for the fortunate few but report writing is more likely to be a repetitive task.

Report Writer was developed from the experience of the author as a teacher and the instruction manual is correspondingly biased towards the presentation of school reports, although there is no reason why it should not be used in fields unrelated to teaching. The instructions are intelligent and well-written; it is a pleasure not to have to load Quill to read about a program. Some of the terminology used will be obscure to users but its usage soon becomes clear.

The writing of school reports is, after all, a major industry and it is not surprising to find it has acquired a terminology of its own.

The program is available on cartridge or 3.5in. disc. It will run on an unexpanded QL, taking about 54KB of memory. It has been tested in the field, as it was developed over a year or so. The coding is in Super-Basic, so keen users can make changes to suit their report requirements and then compile it into a faster-running, multi-tasking program if desired.

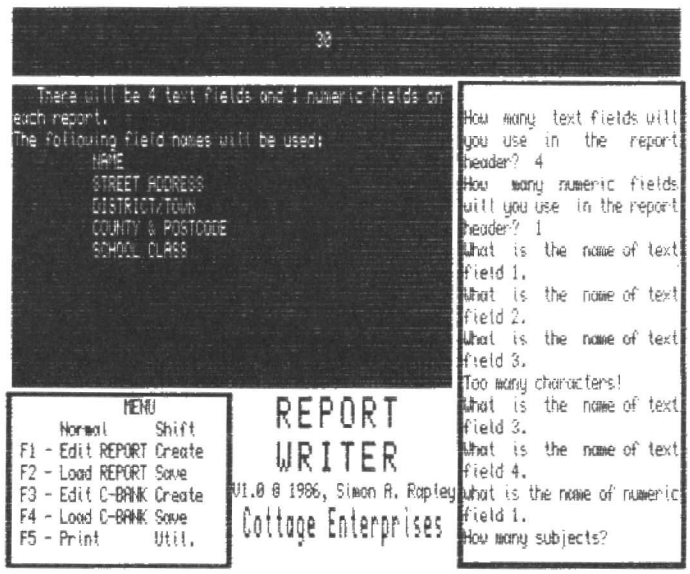
Although speed of operation is not particularly important in an input-intensive program, loading is distinctly slow, as it stands. The *QLoad* routine from Liberation Software would be useful to speed loading. One facet which may not endear the program to users is its lack of error-trapping. The reason given is that the error-trapping capabilities of the various Qdos versions are not consistent. The program will stop when errors occur or ignore them. If a Save is attempted to a drive with no cartridge/disc in it, the program appears to take no notice and continues to the next step.

After a stoppage, entering the command "DO" takes the user back to the main menu, with any work done to that point still intact, making it possible to recover and start again. Use of the "RUN" command to re-start re-initialises everything and all work is lost. While it is appreciated that incorporating error-trapping into an SB program is not the easiest job, commercial programs generally provide a fair amount of protection for the user against illegal actions and you can have to type-in "DO" and "ENTER" rather too often for comfort with Report Writer.

In fairness to the author it should be said that the program commands are simple to use and, remember, it should be possible to avoid hitting the incorrect function key, or having files in the incorrect drive, after a little practice.

The operations in Report Writer are divided into creation of the Comment Bank and of the Report File. It is somewhat similar to a mail-merge operation, in that Comment Bank and Report File can be compared to a name and address list and a form letter, in the way they are handled. As the manual uses examples from school, the same approach will be taken here. The comment Bank consists of a list of Categories, limited only by available computer memory, together with Headings for them.

The terminology comes in now, with the requirement to choose a "descriptor"; this is an important action, since the descriptor chosen will apply throughout a Comment Bank, though you can have as many Banks as you care to create. There are four types of descriptor, which are explained in terms of "leading and trailing stems."



The display during creation of a Report format.

Examples of possible details for Categories will make this clear. "This (boy/girl) is in Group "C" is a sentence which might be used many times, with only the portion in brackets changing; it is said to have a common leading stem ("This") and a common trailing stem ("is in Group C"). The (boy/girl) part is a variable. "This pupil is (bright/average/dumb)" has a common leading stem only, with the end part of the sentence changing each time it is used. "(He/she) will be given a Scholarship" has a common trailing stem, with the initial part changing.

The fourth type covers where there is no commonality between usages; each sentence is different from the others. There is no limit to the number of descriptive words (variables) or phrases used in a Category but you must specify the number for each Category in each Comment Bank. For example:

Category 1: Her classwork is (of a high standard/generally poor/above average)
Category 2: and she understands the work (well/to a limited extent).

You are now into the stage of filling-in the details of a Comment Bank. More than one Category can be used to form a complete sentence, as in the foregoing example. It is possible to incorporate a Report Header in the Category, at the time of production, as in "Category 1: produces classwork of a (high/low) standard", where the name (the Header) of the pupil being reported on is inserted at the start of the sentence when the report is generated – "John produces classwork of a low standard."

To create a Report File you say how many text or numeric fields are required in the Header. This is the part of the report which identifies about what/who/ you are talking. A pupil's name would go in a text field, an examination mark in a numeric field. Up to nine of

each type of field may be used in a Header, so you are not cramped for description. Each field needs a Heading. You also have to indicate how many "subjects" – e.g., pupils – are to be reported on. The procedure is similar to that for a Comment Bank. You are asked regularly to say (y/n) and accept or refuse the displayed contents of a field; as a time-saver, I would have preferred use of the ENTER key to be taken by the program as acceptance of a default response (usually "y"), rather than having to key-in the character but it is a small point.

Comment Banks and Report Files are saved as separate files. You are advised more than once to allow for the vagaries of mains power supplies. Microdrives and so on, by saving at least two cartridges or discs. The manual takes the new user through the various stages of report generation in a sensible fashion. The "secret" of success is to organise thoughts on report structure before charging ahead.

The windows used for the different Report Writer functions are altered slightly to allow for the differences between TV and monitor. The initial screen has five windows – Input, Reportage, Menu, Title, Instruction & Prompt – and the Title window is laid on the Reportage one if a TV is used. When filling-in a report, the display has three windows – Report Key/Input, Menu/Prompt, Raw Report/Comment Bank Display.

Draft

You are supplied with available menu options and prompts at each stage. The illustration shows the display when the format of a Report is being created (SHIFT+F1). Part of the initial screen is still at lower left and middle, the prompts concerning the Report Headings are down the right side, the keyboard input for the current Heading is at the top ("How many subjects?" = "30"), and the report format is in the middle, with information on what fields it is to contain above it.

Report Writer does not aim to generate a final report. It assembles the necessary data and allows a draft report to be printed, to printer or file. It offers useful print options such as selecting only the last report, or which reports of a set are of current concern; a flag can be placed on individual reports when in edit mode.

When the Report is printed or saved to a file you are asked to specify various things, such as whether or not each descriptor is to be printed on a separate line, whether a Header is to be printed, and whether each report should be on a separate page. With some attention, it would be possible to make the printed report acceptable direct from the program but it is suggested that the final formatting of the Report be done in Quill. The file is Imported and it is advisable to Import it into a blank document with the appropriate format – margins and so on already set – to avoid the "wall-to-wall" text the Import function gives.

A set of small utility routines is included, accessed by keying SHIFT+F5. F1 takes you to the SuperBasic command line, with the display re-set for programming. This can be done at any point; on my system, it was not possible to re-start the program afterwards without re-setting. This point also raised another; when loading, the program sometimes stopped when it reached the "DO" procedure call and it appeared that use of the TK2_EXT command before running the program upset it, so it may not be suitable for users of Toolkit II.

It might have been helpful to some users to be provided with sample Comment Bank and Report files, to give a feel for how to create them, but a few stabs at the job should have most users familiar enough with operation to produce reports. The reports will not be elaborate ones; they will normally be simple, as in "Mary Jane has produced rather poor classwork this term." The ambitious SuperBasic fiddler could develop the program to do something more elaborate, perhaps replacing the appreciable quantity of GOTO instructions in the process. For users who need the simple, repetitive type of report, the program could be well worth the money.

text87

The new Version 3.00 for the '90s

text87 Version 3.00 builds on the performance and reliability of previous versions to offer today's state-of-the-art environment for document production. There is simply no comparable product for the QL, and in many respects it out-performs industry-standard PC word-processors. This fast, versatile program has been vastly enhanced, taking into account many suggestions from already satisfied users, to offer more power and flexibility for the occasional user and the professional alike.

★ Integrated spell-checker finds spelling errors in any part of the document being edited and allows you to browse into its dictionary and modify the offending word in context. Spell-checking is performed at the rate of about 200 words per second. In addition to the 40,000+word English, French and German dictionaries supplied as standard, Dutch and Italian dictionaries can be made available on request, allowing correction of multi-lingual texts. You can easily build up your own additional specialist dictionaries or add words to the standard dictionary by loading and checking your existing documents.

★ The user interface has been enhanced even further. More information is provided on the screen on menu selections and current program settings. As an example of improvements, when a number is requested, the default value can be selected with a key-press instead of entering the whole number.

★ More flexible editing and text manipulation options. Documents can be merged with one command. Text attributes can be globally modified (for example change all or selected underlined test to italic). Easier control of pagination and layout especially for long documents.

All the above are improvements to an excellent program with many advanced and user-friendly features developed over the years. **text87** Version 3.00, as its predecessors, is still the vital upgrade for any QL system.

fountext88, the flexible graphic printer driver for **text87** offers 32 high-quality founts in different styles and sizes up to 72 pixels high. You can use graphic founts without the limitations in text editing and document size imposed by other desktop publishing programs.

founted89, the graphics editor for **text87** and **fountext88** allows you to create founts of up to 84 × 96 pixels and capture screen images to produce picture founts for use with documents.

2488, the state-of-the-art dedicated text-mode printer drivers for Epson, NEC and Star 24-pin printers. With these drivers, **text87** is the only QL program that can use the advanced features of 24-pin printers such as multiple type-faces, proportional spacing, micro-justification, double-height, double-width shadow and outline modes.

typeset89, includes a range of drivers for laser printers. Please write for details.

text87 requires at least 128K memory expansion (256K with **fountext88**).

An independent telephone support service including an excellent step-by-step tutorial disk is available from Mr Terry Harman on **0604 842875**.

Software is available in English, French and German

text87 V3.00 £60 founted89 £15 fountext88 £25
Complete edition: text87 + fountext88 + founted89 £95
2488 £15

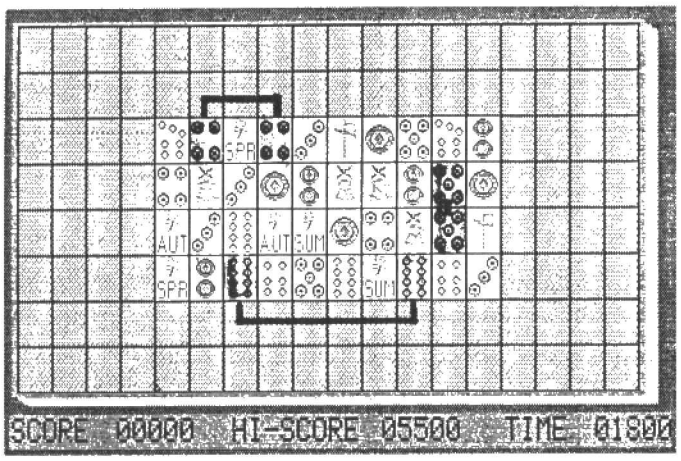
Upgrades to text87 Version 3.00 cost £20 (add £5 if you order by credit card). Please send all your master disks for upgrade to the latest version (an additional manual will be sent to you with the upgrade). Send the text87 manual as well if your version is older than 2.00 (versions supplied during 1988). State where software was bought.

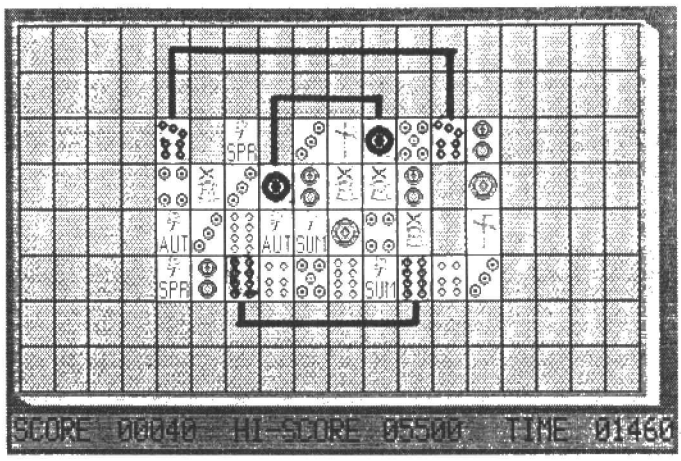
Prices are inclusive of airmail worldwide. Payable by cheque, postal order, Eurocheque or credit card. Please specify language, cartridge or disk system (3½" and 5¼" disks, single or double sided, 80 or 40 track, can be supplied).

Send your order to **Software87, 33 Savernake Road, London NW3 2JU, UK.**

Software87
33 Savernake Road,
London NW3 2JU

SOFTWARE FILE





INFORMATION:
Program: Brain Teaser (formerly Brain Smasher).
Price: £18, 3.5in. disc only, memory expansion required.
Supplier: Jochen Merz via T.K. Computerware, Stone Street, North Stanford, Ashford, Kent. Tel: 0303 81 2801

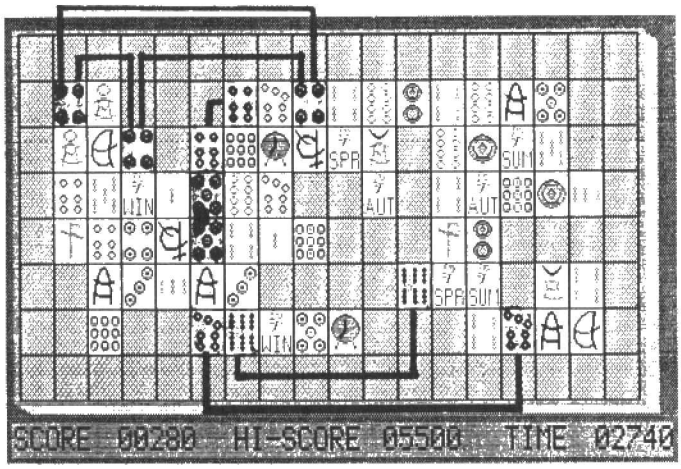
Brain Teaser

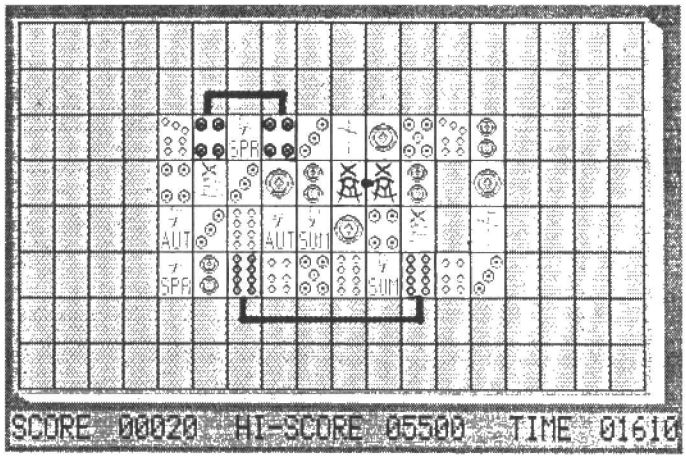
John Shaw confronts a multi-skill game and calls in reinforcements.

This is a new game for the QL written by the talented West German software writer Jochen Merz. In essence it seems to combine the deep concentration needed for chess with the quick eye movements of the arcade player and the decision-making skills of a hard-pressed executive.

Having read the instructions in the handout I confess I thought I was being insulted by the simplicity of the game. Now I can see why the author named it *Brain Teaser*.

On booting you have a choice of F1 German – Deutch, or F2 – English. My German being somewhat lacking, I press F2. The opening display shows a dragon and the choice of an easy game or a difficult game. I decide to take the easy route first and with my joystick I move the cursor round the screen to start the game. Following the pressing of <SPACE> the screen clears and a grid of 4 x 10 squares forms with strange-looking symbols in them.





The simple objective is to clear the screen by finding two identical squares and pressing the <SPACE> button when the cursor is over them. It may seem simple but there is a catch. To capture them, both symbols must be connected by an imaginary line which can cross only empty parts of the board. That line can be bent only twice. The attached diagrams explain how this works.

At this level I am allowed three minutes to complete the task, with a warning bleep sounding when there is only 30 seconds remaining. After four or five attempts, the game is completed with very little effort.

Level two, however, is another thing altogether. Now you have displayed no fewer than 6 x 16 squares and the symbols can be displayed up to four times. You then have the added difficulty of deciding which of the four you pair. The time limit is now set at six minutes 30 seconds with the warning at 40 seconds.

If I might pass on a tip, when you buy it have a friend or two to help you initially with the symbol spotting, or you will do yourself a mental injury.

It is a very fascinating and compulsive game with only two disadvantages. First, buy it only if you have a monitor; some of the symbols are so detailed that they will not show on an ordinary television screen. The second is the cost. Excellent although the game is, I feel many will be deterred by the price.

PDQ Copy V1.2

Multiple copying functions will be helped with hard discs, says Bryan Davies.

INFORMATION:
Program: Copy v.1.2
Price: £10
Supplier: PDQL, Unit 1, Heaton House, Camden Street, Birmingham B1 3BZ. Tel: 021 200 2313

The SuperBasic COPY command in the QL is limited in its usefulness. It forces the user to type-in every detail of the transaction required, does not allow bulk copying of groups of similar files, and does not support the option to have existing files over-written automatically. Various improvements have been offered in add-on toolkits, the best-known presumably being Tony Tebby's *WCOPY* and *COPY_O*, which support wildcard copying and automatic over-writing. Some users no doubt find even those commands rather restrictive, and *PDQ Copy* has some additional features for that kind of user.

One or more files can be copied from one medium to another, with existing files on the copied-to medium being over-written automatically or not, as specified. Strings of files can be specified, as in a wildcard copy but with the extra flexibility of both including and excluding certain categories of file. Up to 350 files can be copied, which should be sufficient for most hard disc users.

An additional function is comparison of size and recording date for files on different devices. This is a separate function from copying. You cannot tell the program to copy only those files whose size has changed since a certain date but the function allows the user to determine which files need copying – backing-up. A report on the files compared can be sent to the screen or a printer; where files differ in size they are marked by **. As the same files on the two media are placed side-by-side on the report it does not take long to scan through even a long listing; the maximum number of files in one operation is again 350.

The devices supported are Microdrive, floppy disc – including the _FDK type interface – hard disc and RAM disc; the numbers 1 to 6 for any device type are acceptable. You cannot use the same device as both "from" and "to". The destination medium can be formatted and given a volume name through the program after the copy command has been selected.

Copying can be in physical disc order or alphabetic order; destination files can be over-written automatically or selectively after a pause; and string-matching can be used to specify

the files to be copied or not copied. Up to three string matches can be specified, separated by full stops.

The string qlw causes all files with that string contained anywhere with the file name to be copied; no other files will be copied unless an additional string is specified. The reverse instruction is .neqlw, which specifies that any files containing the string qlw should not be copied – the ".ne" meaning "not equal" – in which case all files on the "from" medium are copied except those containing that string in the file name.

The string pdql.qlw specifies that files containing either of these two strings should be copied. The program does not accept a combination of string requests such as ab.neabc – copy files with ab in the file name, but not those with abc – the strings must be "all included" or "all excluded" types.

As it is often the first few or the last few characters, such as the suffix, which will determine whether or not a file needs copying, the specifiers < and > are included. <qlwa causes all files starting with those four characters to be copied and >doc causes all those which end with these three characters to be copied.

With the large number of files which tend to be present on hard disc some operations can take a long time and the program offers to beep when chosen functions are completed – a small thing but highly desirable in such a program.

If automatic over-writing of existing files is not specified there is a pause before each copy operation takes place and the user is asked to say 'y' or 'n' to it. When the destination medium does not have sufficient space to hold the specified copy files the user is advised and the program copies the files it can get on to the medium. Any files not copied because of lack of space are identified as "not done". A good point here is that copying does not stop if one file is too big to go on the destination medium; the program skips that file and looks for another which will fit.

This method gives maximum utilisation of a back-up medium. You are kept informed of each file which is being copied or deleted prior to copying. There are occasions when two or more identical copy operations are needed, such as copying the contents of one disc to two other discs. COPY permits this by asking whether or not a similar copy operation is required when the initial one is completed; if you answer 'y' the program performs the same copying operations again with no further prompting.

The program worked well using the devices flp/mdv/ram and did what is claimed of it, with two exceptions. I could not get the file-exclusion function (".ne") to work initially. On enquiry, it was discovered that, despite what the instructions say, there should not be a space between the "ne" and the string.

The example given in the instructions – ".ne PDQL" – does not work. It should read ".nepdql" or ne.PDQL. One illustration shows the screen when all selections have been made, ready for copying to start; the other illustration shows the resulting copying in progress.

Reason

The program quit on two occasions when copying to a dynamic RAM disc which became full. I was not able to check operation with hard disc but there is no obvious reason to expect problems with that, except that sub-directories are not supported; most of my copying activities when using hard disc are based on sub-directories, so lack of this feature would be a distinct disadvantage to me.

What seems a possible cause of the stoppages was shortage of system free memory, as the program reserves sufficient memory to hold the file to be copied but there may not then

be a similar amount free for the file to be added to the RAM disc if the system is fully-loaded.

The problem might not occur with fixed RAM disc, or when there is less or different software loaded at the same time. It is not a sufficiently likely event to cause much trouble anyway. Regarding sub-directories, PDQL advises that its HardBack utility is designed to cope with them, whereas Copy was written before there was any firm specification available for the drive software of hard disc units now on the market.

Additions

As with some other PDQL programs, COPY requires additions to the SuperBasic instruction set, in the form of the XTRAS file which is loaded by a boot file prior to the program being EXEC-ed; COPY is a Turbo-compiled program and can be multi-tasked with other EXEC-ed programs. Many users will already have either the XTRAS file, or a similar one such as TURBO_TK_-CODE from Digital Precision programs – *The Editor, Turbo* and so on. When available memory permits, it is useful to load one of these files as a basic operation, regardless of what program is to be run; this procedure avoids the necessity to re-set the QL when one of the programs which needs the extra instructions is to be run.

Make sure to use the latest version of the extensions file you have, in case one of the programs needing it requires either an instruction which has been added to the original list or one which has been revised.

This touches on what may be one definition of "QL types" – are you a "resetter", or the "I never touch the button" type? The writer of COPY is in the latter category, taking the view that, once a computer is on, it should stay on – with its memory state undisturbed by the re-set action.

The instructions on a _DOC file were adequate, with the reservation about the file-exclusion function noted. The basic memory space taken was about 40KB with up to another 50KB being used during the checks which were made; the amount needed presumably depends on the number and/or size of files being processed. Copying 190 files from one almost full 720KB disc to another, putting them in alphabetic sequence, took about 20 minutes.

With the arrival of the hard disc on the QL scene the additional Copy features provided are far from being mere frills. Hard disc users soon grow to regard them as basic necessities. It is instructive to look at what is provided for PC-compatibles, to get a feel for what is now required for the QL, and the major utility programs – which are sold in millions of copies – provide considerable flexibility in copying.

PDQ Copy is one step towards giving the QL user similar utility capability to that enjoyed by the PC user. In the long run, it would be satisfactory to have integrated packages of utilities, preferably with optional graphical interfaces, which could be loaded permanently and available, in the fashion of PC "pop-up" programs which are very cheap compared to applications programs, costing typically £50-£100.

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Sam the little SPACEMAN

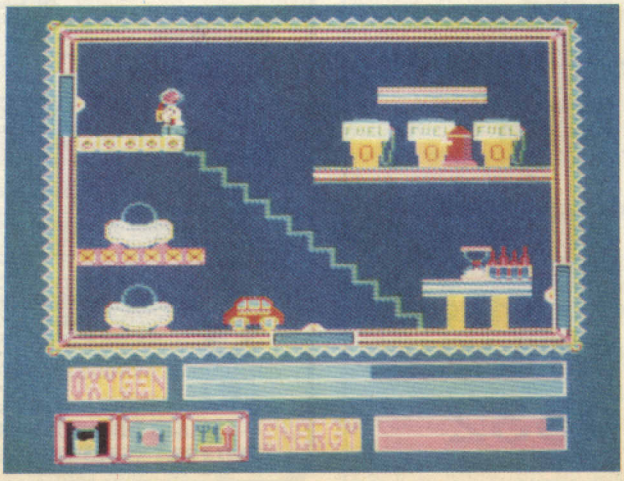
INFORMATION:
Program: Sam The Little Spaceman
Price: £10 (£5 with own medium). Payment in cash, otherwise add £5 for costs.
Supplier: Alobasoft, Kirjurintie, SF-05400 Jokela, Finland.

Dave Watson ventures out into a space platform game with colourful graphics and plenty of plot.

Do not be deterred by the silly title of this game – perhaps it is better in Finnish – because it is a cracker. Poor old Spaceman Sam's rocket has been disabled by hordes of alien thingies and vital parts and components have been scattered far and wide. Your task is to guide the little fellow round his ship to get the engine re-started and switch on the oxygen. While accomplishing this none-too-easy endeavour you must avoid energy-draining close encounters of the nasty kind.

Ingenious

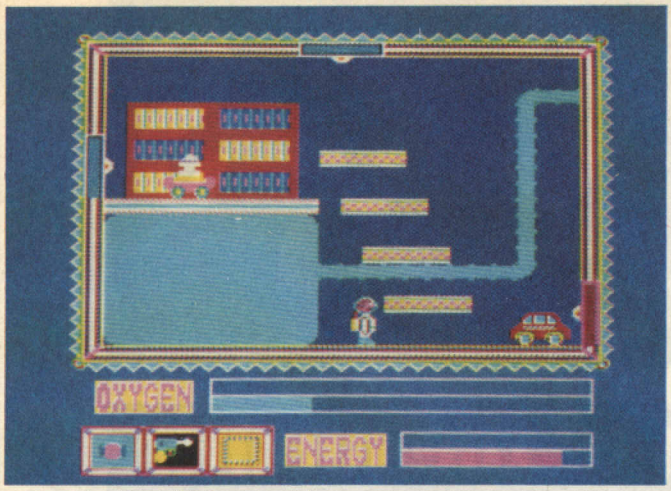
This is an ingenious twist to the old platform game a la *QL Caverns*. The screens are just as good and colourful and there are plenty of them to negotiate. At the last count I had mapped 45. Each buzzes with alien sprites of every kind, from Daleks to belligerent birthday cakes. The extra element to the game which gives it an infuriating and addictive quality is that your little spaceman can pick up and carry the scattered ship's components – but only three at any time. The currently-held parts are displayed as perplexing icons in three boxes at the foot of the display, beside your energy and oxygen indicators. As you obtain a part by jumping or walking through it, its icon passes into the left-hand box. This action shunts the right-most icon out of its box and on to the screen in the place of the new icon. Finally it becomes clear that the task is to carry a part – and there are plenty – to where it should properly be and swap it with the icon which is there in its place.



Perished

My copy of the game arrived with scarcely any instructions and I had to work out that information for myself. So far I have managed to relocate only one component properly. For that, before I perished through lack of oxygen, I gained the massive score of three per-cent. The only keypresses available are / to halt the game, the arrow keys to move and Space to shoot. Shoot? It does not seem to work and it will not until you have located the gun and picked it up.

Scattered around sparingly are little packets of food. Grabbing them will restore your energy which falls with every zap from an alien or ill-judged leap from a high platform. You will also find small yellow



oxygen bottles which replenish your vital air supply. Some of the doorways are locked, though one of the icons is a key. One screen is completely black and I have still to discover how to turn on the light.

Icons

Most of the icons seem indecipherable initially. There are a computer disc, an hourglass, a lamp, a book but where do they go?

Sam The Little Spaceman is an absorbing and delightful game and a thoroughly professional piece of software. The animation is smooth and flicker-free. The graphics are excellent and a constant surprise with each new screen discovered. The real hook is that it is not too difficult to progress far in a short time. The aliens are easy to avoid once you have the knack. So, unlike some games, you do not perish in the first 15 seconds. Watch how you jump near steps and ledges. Knowing where to go for food and oxygen is the real secret of success – if you can call a score of three percent success.

Package

For those interested in programming Aholasoft also has an associated package on offer. It includes the assembly language source files of the game with program comment, a sprite generator which it says can even operate from within SuperBasic, a sprite designer and a screen designer. Those items are bundled on mdvs or DSDD 80-track 5.25in. disc for £50.

You will have to make up your mind whether that is good value. What I can tell you is that if you enjoy platform games and want a colourful diversion during the dark winter months, at £5 Sam The Little Spaceman is worth every penny.

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Program of the month

LOCK AND KEY

by Henry Wrightson

Lock and Key is a platform game where the object is to guide a little man, Leonard, round the screens collecting all the keys so that he may continue to the next screen. On his travels he will have to jump from platform to platform and move up and down the ladders. Dotted round the screens are plums and cherries, worth 50 and 100 points respectively, and killer weeds which do just that. If Leonard falls too far he will go 'splat', to his profound dismay.

Use the cursor keys to control Leonard's ramblings and the space bar to launch him into space.

Time limit

After the first 2,000 points gained and 1,500 points thereafter, an extra life is awarded and there is a time limit on each screen, so do not dally.

When you have typed-in the program "lock_makeFILE", run it with a cartridge in mdv1_. This will create a file called "plat_data" which contains the data for each screen. The cartridge with this file on it must be present in mdv1_ when you LOAD and RUN "Lock_and_Key".

The screen time limits can be found at the end of each block of data in the Lock_makeFILE program. While Lock_makeFILE is running it keeps track of how far through each block of data it is so that if a number is typed-in incorrectly it will tell you which block of data has the error in it and at what percentage distance into the block the error is.

```
100 REMark  NAME : Lock_makeFILE
110 REMark  Lock and Key, screen file generator.
120 REMark  Henry J Wrightson
130 REMark  28th October 1989
140 :
150 DIM screen(35,18)
160 OPEN_NEW #3,mdv1_plat_data
170 RESTORE
180 READ scrn:PRINT #3,scrn
190 :
200 FOR s=1 TO scrn
210   FOR y=1 TO 18
220     FOR x=1 TO 35:screen(x,y)=32
230   END FOR y
240   CLS#0:PRINT #0,"Screen :";s:PRINT #0,"Percen
t through :"
250   READ nc
260   FOR n=1 TO nc
270     READ char,bits:tot=0
280     FOR c=1 TO bits
290       READ x,y:tot=tot+(x-y)
300       screen(x,y)=char
310     END FOR c
320     READ checkd
330     IF tot<>checkd THEN
340       PRINT "ERROR about ";INT((n/nc)*100);"%
the way through the data for screen ";s
350       CLOSE #3:DELETE mdv1_plat_data
360       STOP
370     END IF
380     AT #0,1,17:PRINT #0,INT((n/nc)*100);"%"
390   END FOR n
400   PRINT #0\"Printing data..."
410   READ sx,sy,tt
420   FOR y=1 TO 18
430     pr$=""
```

```
440      FOR x=1 TO 35:pr$=pr$&CHR$(screen(x,y))
450      PRINT #3,pr$
460    END FOR y
470    PRINT #3,sx,sy,tt
480    PRINT #0,
490 END FOR s
500 CLOSE #3
510 STOP
520 :
530 :
540 REMark --Number of screens--
550 DATA 8
560 DATA 11,33,23,28,2,7,3,15,3,22,4,34,4,2,5
570 DATA 15,5,8,5,23,7,1,8,24,8,10,10,32,10,25
580 DATA 11,1,12,8,12,12,12,31,13,16,14,19,14
590 DATA 1,16,12,16,33,16,186,36,23,32,2,11,3
600 DATA 18,3,28,4,35,4,7,5,19,5,29,7,35,7,5,8
610 DATA 17,8,23,10,35,10,26,11,5,12,10,12,16
620 DATA 12,25,13,34,13,17,14,10,16,35,16,28,17
630 DATA 288,37,75,29,2,30,2,31,2,8,3,9,3,10,3
640 DATA 16,3,17,3,23,4,24,4,25,4,26,4,27,4,3
650 DATA 5,4,5,5,5,6,5,16,5,17,5,18,5,9,7,10,7
660 DATA 28,7,34,7,5,8,3,8,4,8,12,8,13,8,14,8
670 DATA 15,8,16,8,25,8,26,8,20,10,21,10,22,10
680 DATA 33,10,34,10,2,12,3,12,4,12,9,12,13,12
690 DATA 14,12,15,12,22,13,23,13,24,13,32,13,33
700 DATA 13,20,14,2,16,3,16,4,16,5,16,6,16,7,16
710 DATA 8,16,9,16,13,16,14,16,34,16,16,17,17
720 DATA 17,18,17,19,17,20,17,21,17,22,17,23,17
730 DATA 24,17,25,17,26,17,27,17,485,39,2,27,8
740 DATA 21,14,26,40,2,11,7,15,16,3,41,2,11,8
750 DATA 15,17,1,42,2,27,7,21,13,28,43,1,6,14
760 DATA -8,44,25,9,1,31,1,16,2,28,3,34,3,3,4
770 DATA 8,6,34,6,2,7,12,7,26,7,21,9,35,9,25,10
780 DATA 2,11,9,11,14,11,33,12,6,13,20,13,27,13
790 DATA 34,15,11,16,17,16,35,18,268,46,4,11,4
800 DATA 31,4,18,14,30,15,53,47,7,13,3,18,4,21
810 DATA 6,5,7,1,9,12,9,1,13,20,1,18,150
820 REMark  ----
830 DATA 17,33,15,3,2,19,4,33,4,5,6,27,7,32,8
840 DATA 17,9,26,10,34,10,7,11,11,11,33,13,5,14
850 DATA 20,16,31,16,162,34,1,12,17,-5,35,1,14
860 DATA 4,10,36,17,5,2,34,4,7,6,16,7,22,7,30
870 DATA 7,33,8,19,9,29,10,35,10,9,11,15,11,35
880 DATA 13,7,14,24,16,32,16,17,18,200,37,15,4
890 DATA 2,20,4,6,6,28,7,29,7,18,9,27,10,28,10
900 DATA 8,11,12,11,13,11,14,11,34,13,6,14,23
910 DATA 16,128,38,3,21,5,15,6,21,6,40,39,2,21
920 DATA 16,14,17,2,40,6,21,4,15,5,22,15,13,16
930 DATA 15,16,16,17,29,41,7,14,5,15,7,21,7,22
940 DATA 16,13,17,15,17,16,18,29,42,3,21,15,12
950 DATA 16,14,16,0,43,4,11,3,4,9,10,9,3,14,-7
960 DATA 44,25,4,1,11,1,32,1,17,2,21,3,15,4,7
970 DATA 5,23,5,26,5,16,6,33,7,4,8,19,8,28,9,35
980 DATA 9,8,10,14,10,7,12,35,12,3,13,1,14,20
990 DATA 15,24,15,31,15,16,16,244,45,52,2,1,10
1000 DATA 1,2,2,10,2,2,3,10,3,2,4,10,4,30,4,2,5
1010 DATA 10,5,30,5,2,6,10,6,23,6,30,6,2,7,10,7
1020 DATA 23,7,2,8,10,8,16,8,23,8,2,9,16,9,23,9
1030 DATA 2,10,16,10,23,10,2,11,10,11,16,11,23
1040 DATA 11,2,12,10,12,16,12,23,12,2,13,10,13
1050 DATA 16,13,23,13,2,14,10,14,16,14,23,14,2
1060 DATA 15,10,15,23,15,2,16,10,16,2,17,2,18,123
1070 DATA 46,8,27,3,28,3,29,3,35,5,1,10,28,14,14
1080 DATA 18,15,18,103,47,3,11,7,5,8,11,13,-1,48
1090 DATA 4,14,15,5,18,22,18,33,18,5,49,5,4,18
1100 DATA 6,18,21,18,28,18,32,18,1,35,18,150
1110 REMark  ----
1120 DATA 11,33,22,1,2,5,2,10,2,15,2,2,5,8,5,13
1130 DATA 5,26,5,30,6,3,8,9,8,14,8,2,11,8,11,13
1140 DATA 11,18,12,3,14,9,14,14,14,2,17,8,17,13
1150 DATA 17,30,36,22,3,2,8,2,13,2,16,2,4,5,9,5
1160 DATA 14,5,27,5,31,6,5,8,10,8,15,8,4,11,9,11
1170 DATA 14,11,19,12,5,14,10,14,15,14,4,17,9,17
1180 DATA 14,17,62,37,10,2,2,6,2,7,2,11,2,12,2
1190 DATA 3,5,4,8,3,11,4,14,3,17,-10,39,1,35,17
1200 DATA 18,40,1,35,16,19,41,1,34,17,17,42,1,34
1210 DATA 16,18,43,50,22,1,28,1,34,1,20,2,26,2
1220 DATA 32,2,18,3,24,3,30,3,22,4,28,4,34,4,20
1230 DATA 5,32,5,18,6,24,6,22,7,28,7,34,7,20,8
1240 DATA 26,8,32,8,18,9,24,9,30,9,22,10,28,10
1250 DATA 34,10,20,11,26,11,32,11,24,12,30,12,22
1260 DATA 13,28,13,34,13,20,14,26,14,32,14,18,15
1270 DATA 24,15,30,15,22,16,28,16,20,17,26,17,32
1280 DATA 17,18,18,24,18,30,18,822,44,38,7,1,26
1290 DATA 1,34,3,3,4,9,4,14,4,26,4,18,5,30,5,22
1300 DATA 6,9,7,9,7,14,7,26,7,30,8,34,9,3,10,9
1310 DATA 10,14,10,32,10,30,11,28,12,3,13,9,13
1320 DATA 14,13,26,13,35,13,18,14,24,14,22,15,3
1330 DATA 16,9,16,14,16,20,16,26,16,18,17,30,17
1340 DATA 35,18,342,46,9,30,2,24,4,6,5,7,8,20,10
1350 DATA 34,12,7,14,30,14,6,17,78,47,8,1,1,20
1360 DATA 1,11,5,28,6,11,11,22,11,11,17,28,18,62
1370 DATA 13,18,200
1380 REMark  ----
1390 DATA 17,33,16,27,2,33,3,4,4,18,5,25,6,9,7
1400 DATA 31,7,13,9,5,10,27,10,33,11,14,14,31,14
1410 DATA 6,15,30,16,10,17,166,34,1,4,18,-14,35
1420 DATA 1,14,2,12,36,18,25,2,31,2,35,3,8,4,23
1430 DATA 6,26,6,15,7,32,7,17,9,9,10,30,10,34,11
1440 DATA 6,13,35,14,8,15,31,16,13,17,25,17,234
1450 DATA 37,46,16,2,17,2,18,2,19,2,20,2,21,2,22
1460 DATA 2,23,2,24,2,28,2,29,2,30,2,34,3,5,4,6
1470 DATA 4,7,4,19,5,20,5,22,6,10,7,11,7,12,7,13
1480 DATA 7,14,7,14,9,15,9,16,9,6,10,7,10,8,10
1490 DATA 28,10,29,10,5,13,15,14,16,14,17,14,32
1500 DATA 14,33,14,34,14,7,15,20,16,21,16,11,17
1510 DATA 12,17,23,17,24,17,454,38,4,4,14,4,15
1520 DATA 4,16,4,17,-46,39,1,15,3,12,40,4,21,5
1530 DATA 18,14,19,15,22,16,30,41,5,14,3,21,6,18
1540 DATA 15,19,16,22,17,37,42,2,15,2,4,13,4,43
1550 DATA 2,2,8,1,11,-16,44,19,17,1,35,1,4,2,12
1560 DATA 4,19,4,22,5,8,6,31,6,15,8,8,9,27,9,35
1570 DATA 9,1,10,5,12,33,13,19,14,20,15,12,16,23
1580 DATA 16,186,45,17,2,4,2,5,30,5,2,6,30,6,2
1590 DATA 7,30,7,30,8,30,9,26,10,26,11,26,12,26
1600 DATA 13,26,14,26,15,26,16,26,17,201,46,12
1610 DATA 5,1,11,8,8,11,1,14,3,14,2,15,1,16,3,16
1620 DATA 7,16,2,17,1,18,3,18,-117,47,12,12,1,16
1630 DATA 11,23,12,2,14,11,14,1,15,3,15,2,16,1
1640 DATA 17,3,17,2,18,32,18,-60,48,8,12,6,13,6
1650 DATA 34,10,34,13,6,14,18,18,20,18,26,18,60
1660 DATA 49,8,5,3,16,13,31,15,15,18,16,18,17,18
1670 DATA 19,18,21,18,19,11,18,160
1680 REMark  ----
1690 DATA 16,33,27,19,1,1,2,7,2,16,2,25,2,33,2
1700 DATA 12,4,31,4,2,5,13,6,33,6,5,7,31,8,7,9
1710 DATA 21,9,1,10,33,10,21,11,3,12,31,12,2,14
1720 DATA 26,14,33,14,5,16,12,16,8,17,21,17,220
1730 DATA 35,2,24,5,5,11,13,36,23,20,1,5,2,10,2
1740 DATA 31,2,35,2,14,4,33,4,5,5,25,6,35,6,9,7
1750 DATA 33,8,4,9,22,9,28,9,35,10,33,12,29,14
1760 DATA 35,14,6,16,10,17,18,17,24,17,306,37,67
1770 DATA 2,2,3,2,4,2,8,2,9,2,17,2,34,2,27,3,28
1780 DATA 3,29,3,13,4,32,4,3,5,4,5,14,6,15,6,16
1790 DATA 6,17,6,18,6,19,6,34,6,6,7,7,7,8,7,32
1800 DATA 8,8,9,15,9,16,9,17,9,27,9,2,10,34,10
1810 DATA 10,11,11,11,12,11,22,11,23,11,24,11,25
1820 DATA 11,4,12,32,12,3,14,4,14,5,14,6,14,7,14
1830 DATA 8,14,9,14,10,14,11,14,12,14,13,14,14
1840 DATA 14,15,14,16,14,17,14,18,14,27,14,28,14
1850 DATA 34,14,13,16,9,17,15,17,16,17,17,17,22
1860 DATA 17,23,17,391,38,8,18,3,18,4,20,5,9,10
1870 DATA 18,10,26,10,18,11,18,12,80,39,9,30,3
1880 DATA 19,5,20,6,3,10,14,10,13,11,26,11,5,12
1890 DATA 19,14,67,40,7,18,2,26,2,20,4,9,9,18,9
1900 DATA 19,13,14,16,69,41,6,26,3,18,5,24,6,9
1910 DATA 11,18,13,14,17,54,42,6,30,2,19,4,3,9
1920 DATA 14,9,26,9,13,10,62,43,1,18,8,10,44,31
1930 DATA 9,1,18,1,35,1,29,2,14,3,17,3,19,3,35
1940 DATA 3,4,4,26,4,4,6,7,6,17,7,19,7,31,7,35
1950 DATA 7,27,8,2,9,13,9,12,10,4,11,15,11,35,11
1960 DATA 16,12,19,12,23,13,28,13,33,13,10,15,3
1970 DATA 16,6,18,319,45,31,24,1,24,2,24,3,24,4
1980 DATA 25,4,25,5,26,5,26,6,26,7,26,8,20,11,20
1990 DATA 12,20,13,1,14,20,14,25,14,1,15,4,15,20
2000 DATA 15,25,15,1,16,4,16,7,16,20,16,25,16,1
2010 DATA 17,4,17,7,17,20,17,25,17,4,18,158,46
2020 DATA 10,9,4,11,6,22,6,20,10,17,15,27,16,29
2030 DATA 16,31,16,33,16,35,16,113,47,13,13,2,21
2040 DATA 2,8,4,28,5,29,6,17,10,30,10,8,11,17,11
2050 DATA 28,16,30,16,32,16,34,16,170,48,11,27
2060 DATA 2,1,18,5,18,9,18,11,18,17,18,20,18,26
2070 DATA 18,29,18,31,18,34,18,28,49,15,28,2,7
2080 DATA 18,12,18,14,18,15,18,18,18,19,18,21,18
2090 DATA 24,18,25,18,27,18,28,18,30,18,32,18,33
2100 DATA 18,79,1,1,200
2110 REMark  ----
2120 DATA 17,33,14,2,2,33,2,16,3,14,5,27,6,32,8
2130 DATA 1,9,27,10,13,12,22,12,8,13,3,16,1,17
2140 DATA 22,17,89,34,1,19,3,16,35,5,19,2,24,6
2150 DATA 21,7,23,9,6,10,59,36,12,10,2,34,2,29
2160 DATA 3,32,10,25,12,10,13,34,13,19,14,35,15
2170 DATA 4,16,2,17,26,17,126,37,59,3,2,4,2,5,2
2180 DATA 6,2,7,2,8,2,9,2,13,2,14,2,15,2,16,2,26
2190 DATA 2,27,2,23,4,15,5,16,5,17,5,18,5,19,5
2200 DATA 20,5,31,5,28,6,29,6,19,8,20,8,2,9,3,9
2210 DATA 4,9,5,9,6,9,7,9,8,9,9,9,10,9,11,9,16
2220 DATA 10,17,10,28,10,29,10,30,10,31,10,23,12
2230 DATA 24,12,9,13,17,14,18,14,6,15,7,15,8,15
2240 DATA 9,15,34,15,11,17,12,17,13,17,14,17,15
2250 DATA 17,23,17,24,17,25,17,397,38,19,12,3,12
2260 DATA 4,21,4,12,5,12,6,12,7,24,7,33,7,12,8
2270 DATA 24,8,18,9,24,9,5,12,5,13,5,14,33,14,16
2280 DATA 15,10,16,16,16,129,39,14,17,3,25,3,24
2290 DATA 4,21,5,30,6,21,8,33,8,12,9,18,10,24,10
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2300 DATA 6,11,15,11,14,12,16,17,159,40,6,17,2
2310 DATA 28,2,22,3,32,5,33,6,10,15,109,41,7,28
2320 DATA 3,22,4,32,6,23,10,5,15,33,15,10,17,83
2330 DATA 42,11,12,2,25,2,21,3,24,3,30,5,18,8,15
2340 DATA 10,5,11,14,11,33,13,16,14,131,43,5,31
2350 DATA 2,33,4,1,13,4,14,1,15,22,44,4,1,6,25
2360 DATA 7,5,10,34,14,28,45,40,29,1,35,1,11,2
2370 DATA 29,2,35,2,6,3,11,3,35,3,6,4,11,4,35,4
2380 DATA 6,5,11,5,13,5,35,5,6,6,11,6,13,6,35,6
2390 DATA 6,7,11,7,13,7,35,7,6,8,11,8,13,8,35,8
2400 DATA 13,9,35,9,35,10,35,11,35,12,29,13,35
2410 DATA 13,29,14,35,14,29,15,29,16,29,17,29,18
2420 DATA 596,46,8,5,4,7,4,32,7,1,10,9,10,15,12
2430 DATA 29,12,19,15,43,47,14,4,3,5,3,7,3,8,3
2440 DATA 13,3,23,3,4,4,8,4,31,6,2,10,1,11,2,11
2450 DATA 16,11,20,14,55,48,3,33,5,32,9,33,12,72
2460 DATA 49,4,31,4,32,4,31,9,34,12,99,24,16,200
2470 REMark  ----
2480 DATA 15,33,12,2,2,8,2,34,2,13,3,22,3,31,4
2490 DATA 17,6,3,8,34,9,9,14,20,14,28,14,140,34
2500 DATA 3,27,2,27,15,30,15,52,35,7,10,1,27,1
2510 DATA 4,7,27,13,30,13,32,13,35,13,104,36,12
2520 DATA 35,2,16,3,6,4,27,4,34,5,29,8,35,9,35
2530 DATA 11,8,12,12,14,29,14,35,18,197,37,63,3
2540 DATA 2,4,2,9,2,14,3,15,3,23,3,24,3,26,4,32
2550 DATA 4,18,6,19,6,21,7,24,8,25,8,26,8,27,8
2560 DATA 28,8,23,9,4,11,27,11,28,11,29,11,30,11
2570 DATA 31,11,32,11,33,11,34,11,6,12,7,12,25
2580 DATA 12,23,13,10,14,11,14,21,14,14,16,15,16
2590 DATA 16,16,17,16,18,16,19,16,20,16,21,16,22
2600 DATA 16,10,17,11,17,12,17,13,17,23,17,24,17
2610 DATA 25,17,26,17,27,17,2,18,5,18,6,18,7,18
2620 DATA 8,18,29,18,30,18,31,18,32,18,33,18,34
2630 DATA 18,483,38,12,5,3,22,8,2,11,2,12,2,13
2640 DATA 2,14,27,14,30,14,32,14,35,14,2,15,1,17
2650 DATA 13,39,13,10,2,4,8,24,9,26,12,24,13,22
2660 DATA 14,33,15,35,13,2,16,3,18,9,18,14,18,23
2670 DATA 18,53,40,13,5,2,25,3,33,4,20,6,22,7,24
2680 DATA 7,3,10,5,11,34,14,23,16,4,17,14,17,28
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2690 DATA 17,109,41,15,5,4,25,4,33,5,20,7,23,8
2700 DATA 22,9,3,11,5,12,32,15,34,15,1,18,4,18
2710 DATA 13,18,22,18,28,18,90,42,11,23,7,2,10
2720 DATA 26,11,24,12,22,13,33,14,1,16,13,16,3
2730 DATA 17,9,17,22,17,28,43,13,6,2,4,4,1,5,12
2740 DATA 5,9,6,7,7,13,8,15,8,11,9,18,10,14,11
2750 DATA 17,12,1,15,26,44,17,9,1,34,1,4,3,12,4
2760 DATA 27,5,7,6,3,7,15,7,11,8,35,8,4,10,23,10
2770 DATA 12,11,17,11,1,14,23,14,31,15,133,45,10
2780 DATA 17,3,21,3,17,4,21,4,17,5,21,5,21,6,32
2790 DATA 8,32,9,32,10,174,46,3,19,1,19,3,6,14
2800 DATA 26,47,6,1,2,19,2,35,3,18,9,14,10,7,14
2810 DATA 54,2,17,170
2820 REMark  ----
2830 DATA 15,33,23,1,2,4,2,22,2,29,2,9,3,14,4,18
2840 DATA 4,33,4,32,6,2,7,19,7,28,7,12,8,34,8,3
2850 DATA 9,16,10,33,10,1,11,9,12,35,12,5,13,18
2860 DATA 13,31,15,237,35,3,17,8,20,10,4,15,8,36
2870 DATA 23,2,2,7,2,24,2,33,2,10,3,15,4,20,4,35
2880 DATA 4,34,6,4,7,20,7,30,7,13,8,35,8,4,9,34
2890 DATA 10,2,11,21,11,20,13,8,15,16,15,33,15
2900 DATA 7,18,244,37,16,5,2,6,2,23,2,30,2,31,2
2910 DATA 32,2,19,4,34,4,33,6,3,7,29,7,10,12,11
2920 DATA 12,19,13,15,15,32,15,225,38,1,17,9,8
2930 DATA 39,1,17,10,7,40,7,12,12,6,13,13,13,7
2940 DATA 14,14,14,5,16,6,17,-36,41,9,20,11,12
2950 DATA 13,6,14,13,14,7,15,14,15,4,16,5,17,6
2960 DATA 18,-46,43,20,13,3,25,4,11,5,8,6,21,6
2970 DATA 24,6,7,9,10,9,25,9,31,9,26,10,30,10,23
2980 DATA 13,27,13,1,15,11,15,22,15,19,17,26,17
2990 DATA 29,17,181,44,21,1,1,12,1,18,1,14,3,25
3000 DATA 3,8,5,21,5,24,5,32,5,2,6,29,6,12,7,4
3010 DATA 8,10,8,26,9,30,9,10,10,21,10,27,12,22
3020 DATA 14,29,14,235,45,4,3,3,3,4,3,5,3,6,-6
3030 DATA 46,4,35,3,19,6,1,14,1,18,15,47,12,32
3040 DATA 1,17,7,34,7,34,9,35,11,6,12,18,12,20
3050 DATA 12,11,14,1,17,2,17,2,18,75,48,1,10,18
3060 DATA -8,49,3,20,6,19,12,9,18,12,26,18,200
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```
100 REMark  NAME : Lock and Key
110 REMark  A platform game
120 REMark  Henry J Wrightson
130 REMark  10th October 1989
140 :
150 init
160 defchar
170 main
180 MODE 8
190 STOP
200 :
210 :
220 DEFine PROCedure init
230  MODE 8:PAPER 0:CLS
240  PRINT #2,"Please wait...  Setting up..."
250  OPEN_IN #4,mdv1_plat_data
260  REPeat read_screens
270    INPUT #4,line$
280    IF EOF(#4)=1 THEN EXIT read_screens
290  END REPeat read_screens
300  CLOSE #4
310 END DEFine
320 :
330 :
340 DEFine PROCedure main
350  REPeat game_play
360    set_up
370    scrn=1: score=0: life=5: lifescore=2000
380    REPeat screens
390      set_screen
400      die_=0: mo=1: lastdir=-1: key=0: time=tt:
 lda=0
410      INK #0,5:AT #0,0,14:PRINT #0,score;"    "
420      INK #0,4:AT #0,1,14:PRINT #0,life;"   "
430      INK #0,3:AT #0,2,14:PRINT #0,keys;"   "
440      INK #0,2:AT #0,3,14:PRINT #0,scrn;"   "
450      REPeat play
460        make_move
470        IF score>=lifescore THEN
480          bee 8
490          lifescore=lifescore+1500:life=life+1
500          AT #0,1,14:PRINT #0,life
510        END IF
520        IF key=keys THEN EXIT play
530        da$=DATE$:da=da$(19 TO 20)
540        IF da<>lda THEN
550          time=time-1:INK #0,5:AT #0,0,30
560          FLASH #0,time<15:PRINT #0,time;" ":ld
a=da:FLASH #0,0
570          IF time<1 THEN die_=1
580        END IF
590        IF die_ THEN bee 3:loose_life:time=tt:d
ie_=0
600        IF life<1 THEN die_=1:EXIT play
610      END REPeat play
620      scrn=scrn+1:IF die_ THEN fin=1:EXIT scree
ns
630      IF (scrn MOD (scrn_max+1))=0 THEN fin=0:E
XIT screens
640    END REPeat screens
650    CLOSE #4
660    IF fin=1 THEN fin=0:end_it
670    IF fin THEN EXIT game_play
680  END REPeat game_play
690 END DEFine
700 :
710 :
720 DEFine PROCedure set_screen
730  INK 1
740  FOR x=1 TO 35
750    screen(x,0)=37:AT 0,x:PRINT CHR$(37)
760    screen(x,19)=37:AT 19,x:PRINT CHR$(37)
770  END FOR x
780  FOR y=1 TO 18
790    screen(0,y)=38:AT y,0:PRINT CHR$(38)
800    screen(36,y)=38:AT y,36:PRINT CHR$(38)
810  END FOR y
820  screen(0,0)=42:AT 0,0:PRINT CHR$(42)
830  screen(0,19)=41:AT 19,0:PRINT CHR$(41)
840  screen(36,0)=40:AT 0,36:PRINT CHR$(40)
850  screen(36,19)=39:AT 19,36:PRINT CHR$(39)
860  keys=0
870  FOR y=1 TO 18
880    INPUT #4,line$
890    FOR x=1 TO 35
900      screen(x,y)=CODE(line$(x))
910      IF screen(x,y)=44 THEN keys=keys+1
920      INK in(screen(x,y)-32)
930      AT y,x:PRINT CHR$(screen(x,y))
940    END FOR x
950  END FOR y
960  INK 6
970  INPUT #4,details$
980  sx=details$:sy=details$(5 TO 10):tt=details$(
11 TO)
990  x=sx:y=sy:AT y,x:PRINT CHR$(50)
1000 END DEFine
1010 :
1020 :
1030 DEFine PROCedure set_up
1040  CLS
1050  DIM screen(36,19),in(17)
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```
1060  be=0
1070  RESTORE 2810
1080  FOR i=1 TO 17:READ in(i)
1090  INK #0,6:AT #0,0,0:PRINT #0,"Score        : "
1100  AT #0,1,0:PRINT #0,"Lives        : "
1110  AT #0,2,0:PRINT #0,"Keys to get : "
1120  AT #0,3,0:PRINT #0,"Screen       : "
1130  AT #0,0,23:PRINT #0,"Time : "
1140  OPEN_IN #4,mdv1_plat_data
1150  INPUT #4,scrn_max
1160 END DEFine
1170 :
1180 :
1190 DEFine PROCedure make_move
1200  LOCal k,xx,yy
1210  k=KEYROW(1):xx=0:yy=0:b=0
1220  SELect ON k
1230    =4:IF screen(x,y)=45 THEN yy=-1
1240    =128:IF screen(x,y+1)=45 THEN yy=1
1250    =2:IF mo=-1 THEN xx=-1:ELSE mo=-1
1260    =16:IF mo=1 THEN xx=1:ELSE mo=1
1270    =64:bee 6:jump 2
1280    =66:mo=-1:bee 6:jump 2
1290    =80:mo=1:bee 6:jump 2
1300    =8:die_=1
1310  END SELect
1320  move_ xx,yy
1330  s=screen(x,y+1)
1340  IF (s<33 OR s>43) AND s<>45 AND key<>keys TH
EN bee 5:fall
1350  IF be=5 OR be=6 THEN BEEP
1360 END DEFine
1370 :
1380 :
1390 DEFine PROCedure move_(xx,yy)
1400  IF mo=-1 THEN man$=CHR$(50):ELSE man$=CHR$(5
1)
1410  IF yy<>0 AND mo=-1 THEN man$=CHR$(53)
1420  IF yy<>0 AND mo=1 THEN man$=CHR$(52)
1430  s=screen(x+xx,y+yy)
1440  IF s<33 OR s>43 THEN
1450    s=screen(x,y)
1460    INK in(s-32):AT y,x:PRINT CHR$(s)
1470    x=x+xx:y=y+yy
1480    INK 6:AT y,x:PRINT man$
1490  END IF
1500  IF screen(x,y)>43 THEN check_scr
1510 END DEFine
1520 :
1530 :
1540 DEFine PROCedure jump(n)
1550  LOCal up,down
1560  FOR up=1 TO n:move_ mo,-1
1570  FOR along=1 TO 2:move_ mo,0
1580  IF key<>keys THEN fall
1590 END DEFine
1600 :
1610 :
1620 DEFine PROCedure fall
1630  LOCal f,down
1640  f=0:IF screen(x,y)>43 THEN check_scr
1650  REPeat down
1660    s=screen(x,y+1)
1670    IF s>32 AND s<44 THEN EXIT down
1680    move_ 0,1
1690    IF key=keys THEN die_=0:EXIT down
1700    f=f+1:IF f>5 THEN die_=1
1710  END REPeat down
1720 END DEFine
1730 :
1740 :
1750 DEFine PROCedure check_scr
1760  LOCal s
1770  s=screen(x,y)
1780  SELect ON s
1790    =46:add_score 50:screen(x,y)=32:bee 1
1800    =47:add_score 100:screen(x,y)=32:bee 2
1810    =48,49:die_=1
1820    =44:bee 4:addkey
1830  END SELect
1840 END DEFine
1850 :
1860 :
1870 DEFine PROCedure bee(b)
1880  SELect ON b
1890    =1:BEEP 5000,10,100,1000,5,0,0,0
1900    =2:BEEP 5000,10,100,1000,1,0,0,0
1910    =3:BEEP 9000,0,0,0,0,0,15,15
1920    =4:BEEP 4500,8,30,400,5,0,0,0
1930    =5:BEEP 0,10,200,2000,1,0,8,0
1940    =6:BEEP 12000,10,90,500,-5,0,0,0
1950    =7:BEEP 200,1,0,0,0,0,13,8
1960    =8:BEEP 22000,0,50,300,7,0,0,0
1970  END SELect
1980  be=b
1990 END DEFine
2000 :
2010 :
2020 DEFine PROCedure add_score(s)
2030  score=score+s:INK #0,5:AT #0,0,14:PRINT #0,s
core
2040 END DEFine
2050 :
2060 :
2070 DEFine PROCedure addkey
2080  key=key+1
2090  INK #0,3:AT #0,2,14:PRINT #0,keys-key;" "
2100  screen(x,y)=32:AT y,x:PRINT " "
2110 END DEFine
2120 :
2130 :
2140 DEFine PROCedure loose_life
2150  INK 6
2160  FOR k=54 TO 58
2170    AT y,x:PRINT CHR$(k)
2180    FOR wait=1 TO 80:END FOR wait
2190  END FOR k
2200  INK in(screen(x,y)-32):AT y,x:PRINT CHR$(scr
een(x,y))
2210  life=life-1:INK #0,4:AT #0,1,14:PRINT #0,lif
e;"  "
2220  x=sx:y=sy:mo=1:INK 6:AT y,x:PRINT CHR$(51)
2230 END DEFine
2240 :
2250 :
2260 DEFine PROCedure end_it
2270  INK 7:PAPER 0
2280  FLASH 1:INK 7:AT 10,12:CSIZE 3,1:PRINT "GAME
 OVER":FLASH 0:CSIZE 0,0
2290  AT 15,7:PRINT "Another game ? (y or n)"
2300  REPeat another
2310    IF KEYROW(7)=64 THEN fin=1:EXIT another
2320    IF KEYROW(5)=64 THEN EXIT another
2330  END REPeat another
2340 END DEFine
2350 :
2360 :
2370 DEFine PROCedure defchar
2380  RESTORE 2540
2390  st=167722
2400  old=PEEK_L (st)
2410  news=RESPR(875)
2420  FOR n=0 TO 875 STEP 4
2430    POKE_L news+n,PEEK_L (old+n)
2440  END FOR n
2450  POKE_L st,news
2460  FOR char=1 TO 26
2470    READ c
2480    charpoke=news+10+(c-32)*9
2490    FOR dat=1 TO 9
2500      READ d:POKE charpoke+dat,d
2510    END FOR dat
2520  END FOR char
2530 END DEFine
2540 REMark          ? CHAR DATA ?
2550 DATA 33,60,64,64,64,60,0,0,0,0
2560 DATA 34,68,68,68,68,56,0,0,0,0
2570 DATA 35,56,68,68,68,68,68,68,68,68
2580 DATA 36,120,4,4,4,120,0,0,0,0
2590 DATA 37,124,0,0,0,124,0,0,0,0
2600 DATA 38,68,68,68,68,68,68,68,68,68
2610 DATA 39,68,4,4,4,120,0,0,0,0
2620 DATA 40,120,4,4,4,68,68,68,68,68
2630 DATA 41,68,64,64,64,60,0,0,0,0
2640 DATA 42,60,64,64,64,68,68,68,68,68
2650 DATA 43,56,68,68,68,56,0,0,0,0
2660 DATA 44,24,36,36,24,8,24,8,24,8
2670 DATA 45,68,124,68,68,124,68,68,124,68
2680 DATA 46,8,16,16,56,100,116,104,48,0
2690 DATA 47,8,16,16,40,100,108,12,0,0
2700 DATA 48,0,0,0,0,0,32,20,88,56
2710 DATA 49,0,0,0,0,0,8,40,116,56
2720 DATA 50,48,48,16,56,20,16,40,36,68
2730 DATA 51,24,24,16,56,80,16,40,72,68
2740 DATA 52,24,24,84,56,16,16,40,40,40
2750 DATA 53,48,48,84,56,16,16,40,40,40
2760 DATA 54,0,56,56,84,56,16,16,40,40
2770 DATA 55,0,0,56,56,80,56,20,16,40
2780 DATA 56,0,0,0,56,56,16,124,16,16
2790 DATA 57,0,0,0,0,56,56,16,124,16
2800 DATA 58,0,0,0,0,0,0,56,56,16
2810 DATA 5,5,5,5,5,5,5,5,5,5,7,5,3,2,4,4
```

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